

**WYOMING VALLEY LEVEE RAISING PROJECT,
LUZERNE COUNTY, PENNSYLVANIA**

LETTER REPORT #4

TOBY CREEK IMPOUNDING BASIN

DRAFT ENVIRONMENTAL ASSESSMENT

February 2007

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Executive Summary

The purpose of this Draft Environmental Assessment (EA) is to obtain compliance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended, for actions being considered as a part of the Wyoming Valley Levee Raising Project, Pennsylvania. The project authorization includes both structural and non-structural components for achieving comprehensive flood hazard protection and mitigation for flows of 318,500 cubic feet per second in the Susquehanna River.

A Letter Report (#4) has been prepared for the rehabilitation of the Toby Creek Impounding Basin and common remedial seepage measures. The basin needs to have an adequate spillway built as well as the rehabilitation of the earthen berms around the impoundment and the spillway leading to the baseflow outlet point. The actions documented in this EA are those covered in Letter report #4. and include mainly the rehabilitation of the Toby Creek Impounding Basin (TCIB) in the Kingston/Edwardsville area of the Levee Raising Project as described in the Letter Report #4. Also, included are some remedial seepage measures described in detail in Attachment A.

The recommended or selected plan for modifying the Toby Creek Impounding Basin was not entirely based on cost and engineering considerations. Various other concerns, such as real-estate, environmental, and impacts to adjacent communities were evaluated and considered in determining the most appropriate plan. Discussions of these various items are provided in the main letter report text.

The recommended plan is the exterior raising for a majority (80-90 percent) embankment raising; however, in certain small restricted reaches, such as along the northeast end of the basin, a straddle or interior raising will be used to reduce the impacts to adjacent properties. The east bank at the very upstream end of Toby Creek inside the basin (left bank looking downstream from the culvert) is the area most likely to have some level of impacts due to the proposed actions. The west side can be adjusted to accommodating the rip rapping but, activity on the east side is restricted by the presence of residential and commercial real estate along the outside toe of the existing embankment. Up to 10,000 square feet of stone could be placed along the slopes of creek. Each reach is up to approximately 1,000 feet long and 5 feet wide on each side of the stream. At the very upstream end of the TCIB riprap and stone will be placed across the creek which is approximately 200 feet long and 50 feet wide. Upstream of and adjacent to the pressure conduit the stream will be covered with stone. The length of this area that will be covered is approximately 100 feet and the width of the stream at this point is approximately 50 feet. In total up to 15,000 square feet of stream bottom will be covered with rock. There is the possibility of significantly reducing or even eliminating this impact but this will not be known until the details of final design are known. If the stream channel section on the east side needs to be reduced then it is most likely that a corresponding area on the west will be provided to maintain the existing conveyance of the stream channel. In total up to 15,000 square feet of stream will be covered with rock.

For the spillway, the plan selected is the RCC broad crested weir overlay spillway, which

consists of placing stair-stepped layers of RCC to create a broad crested weir overflow section and discharge channel on the downstream embankment slope. Due to the limited removal of existing embankment (above current spillway elevation), a temporary cofferdam is not required for this alternative. The selected plan may also include a low embankment or grading and fill along the southeast corner of the basin to prevent overflow from the spillway into the low area of the Borough of Pringle. A graphic of this plan may be found in Appendix A.

The remedial seepage measures described below are considered ordinary activities for a project like Toby Creek. These measures are expected to occur independently of any of the proposed alternatives selected. These are necessary actions and are likely to be undertaken within the next few years if sufficient funding is available. Figures for these remedial actions are included in Appendix A.

- Kingston/Edwardsville downstream of Church Pump Station: Install trench drain and collector pipe for relief wells.
- Swoyersville/Forty Fort adjacent to airport: Install small seepage berm and/or possibility some relief wells.
- Swoyersville/Forty Fort existing seepage berm: Investigate blockage of berm toe and drain. If blocked, then install finger drains
- Kingston/Edwardsville, Kirby Park: Investigation of wet spot on slope.
- Plymouth, near Flat Street ramp: Investigation of wet spot and seepage at toe of levee. Install a small toe drain to collect seepage.
- Wilkes-Barre/Hanover, vicinity of water tunnel: Seepage along toe. -Install small berm and/or relief wells.
- Wilkes-Barre/Hanover, downstream of Delaney Street Pump Station: Install several new relief wells at the toe of the levee berm and abandon the damaged collector pipe and existing relief well system.

The original levee raising project was documented in a feasibility report, Phase I General Design Memorandum (GDM,) and Environmental Impact Statement (EIS)/Record of Decision (ROD) (1981). The TCIB activities and the seepage remediation activities are authorized under this 1981 report. The project Supplemental EIS (SEIS)/ROD was updated in the Phase II GDM (1996). The levee raising project evaluated and presented in these documents, as authorized by Congress, included a mitigation plan for downstream communities adversely affected by the Wyoming Valley Levee Raising Project. In 1998, a Supplemental EA/Finding of No Significant Impact (FONSI) was prepared in response to minor wetland and potential endangered species impacts. A memorandum dated November 8, 2000 from the Assistant Secretary of the Army for Civil works states the Corps of Engineers has the authority for “ all necessary evaluations and modifications of the existing flood control projects to include Coal Creek, Toby Creek, and various relief culverts and penetrations through the levee” (See Attachment B. - Correspondence

for more information on authorization”. Three other Letter Reports have been prepared (with an EA for each) for project sub-elements. Additionally, a General Re-Evaluation Report and Supplemental Environmental Impact Statement (SEIS) were prepared and approved by the Assistant Secretary of the Army for Civil Works (ASA-CW) in 2005.

Upon an evaluation of alternatives and impacts, the actions presented and evaluated in this EA are expected to result in the preparation of a FONSI.

1.0 PURPOSES, NEED, AND SCOPE OF ACTIONS

1.1 Purposes

The purposes of the actions covered in this EA are to document, evaluate, and provide the public and agencies an opportunity to comment on the rehabilitation of the Toby Creek Impoundment Basin (TCIB) (Attachment A) and small remedial seepage measures included in Letter report #4. This Wyoming Valley project element was originally built in the 1930s and has been modified twice, once in 1960 and once in 1970. Due to changes in the Toby Creek watershed over the last 70 years and also due to changing regulations for impoundments and dams in the Commonwealth of Pennsylvania, this structure must be rehabilitated to fulfill its original design purpose and to ensure public safety during such an event. The project element also includes a pressure conduit (a 16-foot diameter underground pipe) that is in good condition and has no action needing to be taken at this time. The action on the basin will be mainly to raise and flatten the earthen berm and to analyze the proper location and design of the spillway. Additionally up to 15,000 square feet of stream bottom will be covered with stone. Construction is anticipated to begin in fall 2007.

1.2 Need

The region known as the Wyoming Valley is located in northeastern Pennsylvania and extends from Duryea on the Lackawanna River southwestward to Nanticoke on the Susquehanna River (Attachment A). The Wyoming Valley flood control projects consists of five contiguous existing Federal flood control projects at Exeter, Plymouth, Kingston/Edwardsville, Swoyersville/Forty Fort, and Wilkes-Barre/Hanover Township. Together, these five projects function as one large flood control system.

From 1891 to 1991, the Wyoming Valley was subjected to 56 floods that have exceeded the estimated channel bank capacity of 127,000 cfs. Although the largest flood of record was caused by a summer tropical storm (1972 Tropical Storm Agnes), most of the historical flooding has resulted from winter precipitation and snowmelt. As evidence, 19 of the 25 largest floods of record occurred between the months of January and April.

The five existing Federal flood control projects in the Wyoming Valley were designed to protect against a flood equal to the March 1936 event that had a peak flow of 232,000 cfs. The existing projects, constructed in the 1940's, were overtopped by several feet during the 1972 Tropical Storm Agnes. This event resulted in an estimated \$1 billion of damages in the Wyoming Valley as referenced in the Phase II GDM/SEIS (1996).

Tropical Storm Agnes-level (318,500 cfs) protection for the Wyoming Valley Levee Raising Project was authorized by the Water Resources Development Act (WRDA) of 1986, Section 401(a) [Public Law 99-662]. The authorized total project cost was \$241 million. The WRDA of 1992, Section 102(w) [Public Law 102-580] amended the project authorization, by providing credit to the non-Federal sponsor for in-kind work and allowing credit to the sponsor for in-kind work completed since 1 June 1972.

A Phase I General Design Memorandum (GDM), Environmental Impact Statement (EIS), and Record of Decision (ROD) were prepared for this project in 1981 to meet National Environmental Policy Act (NEPA) requirements. All of the above documents supported the decision to raise the level of the levee protection. A Phase II GDM, Supplemental EIS (SEIS), and ROD were prepared in 1995 and revised in 1996 in order to document design changes since the preparation of the Phase I GDM/EIS/ROD (1981). Thereafter, a Supplemental Information Document was prepared in May 1997 for minor wetland impacts, and a Supplemental EA and Finding of No Significant Impact (FONSI) were prepared in 1998 for minor impacts to primarily, wetlands and endangered species. The overall environmental, cultural, and socio-economic setting has not significantly changed since preparation of the 1995 and subsequent 1998 NEPA documents.

Several field design changes have occurred, however, the most noteworthy change involved a 3,000-foot section of the levee raising project through the Historic River Commons in Wilkes-Barre, Pennsylvania. In the 1996 GDM/SEIS, the recommended plan included a 3 to 5 foot earthen levee raising. Since that time, the sponsor and local government requested that adverse impacts to the Historic River Commons be reduced. This was achieved through a field design change of an earthen levee to a concrete-capped sheet pile wall. The project will continue to provide flood protection for flows of 318,500 cfs with this field design change.

The Wyoming Valley Levee Raising Project will increase the level of flood protection to the magnitude of Tropical Storm Agnes (318,500 cfs). The project consists of raising levees and floodwalls an average of 3 to 5 feet, modifying closure structures, relocating utilities, and providing some new floodwalls and levees to maintain the integrity of the flood control system. The levee raising project further includes structural modifications to 8 existing sanitary pump stations and structural, mechanical, and electrical modifications to 13 existing stormwater pump stations.

Letter Reports #1-3 documented other project elements that were in need of repairs, endangered species and wetlands impacts or documented the flood hazard mitigation program authorized as part of the Wyoming Valley project.

Letter Report #4 has been prepared for the rehabilitation of the Toby Creek Impounding Basin and minor seepage remediation activities. The basin needs to have an adequate spillway built as well as the rehabilitation of the earthen berms around the impoundment and the spillway leading to the baseflow outlet point.

1.3 Scope

The scope of the impact analysis will be specific to the proposed action as well as for minor design changes that have occurred or are in progress. The impacts analysis will include an evaluation of land use, soils, geology and topography, air quality, water resources, terrestrial resources, rare and endangered species, wild and scenic rivers, cultural resources, hazardous and toxic waste, aesthetics and recreation, socio-economic setting, noise, infrastructure, public services, and safety. Environmental justice and cumulative impacts are assessed for the specific

areas of impact and for the surrounding area of influence. Coordination with agencies and public involvement is also documented.

The project area Wyoming Valley northeast of Pennsylvania is defined as any area within 100 feet out from the current alignment of the impounding basin and related structures. It also included the entire area within the basin, including the Toby Creek channel. Please refer to Figure 1. for a map of the project area.

2.0 EXISTING CONDITIONS

This EA will describe any changes in existing conditions since the December 2005 GRR SEIS. Where there are no changes, that NEPA documentation for the Wyoming Valley Levee Raising Project is hereby incorporated by reference for each sub-heading.

The Toby Creek Impounding Basin (TCIB) is a 243 acre-foot maximum capacity impoundment located in the Borough of Pringle, Luzerne County, Pennsylvania. This basin was constructed by the U.S. Army Corps of Engineers as part of the original Wyoming Valley Levee Protection System built in the 1940's. Its purpose was to impound waters from the upper Toby Creek watershed and direct flow into a 16'-6" diameter underground concrete conduit, referred to as the Toby Creek Pressure Conduit (TCPC). The 6,392-foot long pressure conduit transfers flows from the impounding basin to its outlet at the Woodward Pump Station in the Borough of Edwardsville, where it discharges to the lower section of Toby Creek, outside of the areas protected by the levee system and eventually in the Susquehanna River. The impounding basin receives runoff from approximately 32.4 square miles of the upper Toby Creek watershed.

The impounding basin is surrounded by a horseshoe shaped earthen embankment having an approximate total length of 4,200 linear feet, with slightly varying crest elevation of approximately 572.0 feet NGVD. The earthen embankment is homogenous, having a maximum height of 30 feet, with a 10-foot crest width. The original drawings indicated that a blanket of impervious material was placed on the interior slope of the embankment. The as-built drawings also show a 4-foot deep inspection trench located beneath the centerline. Currently, the interior slopes are 2.5 horizontal on 1 vertical, and exterior slopes are 2 horizontal on 1 vertical. The exterior slopes are also covered with trees in many places. As-built drawings for the original construction, "Toby Creek Pressure Culvert", are provided in Attachment A

Located along the west side of the impounding basin is a 106-foot wide ogee weir spillway. The ogee weir consists of reinforced concrete with reinforced concrete training walls and discharge apron with baffle blocks. The original crest of the ogee weir was constructed to the design elevation of 566.0 feet NGVD. However, the original concrete surface (crest elevation) is significantly lower than the design elevation due to mine subsidence. Previous corrective repairs are discussed below.

Near the completion of the original construction project, two separate flood events caused scouring and damage to the embankment and a portion of the unfinished pressure culvert. Altering the original design of the intake structure was considered the most practical method of stabilizing the channel and reducing erosive velocities in the impounding basing. In general the

modified intake structure consists of a 44-foot wide ogee weir having two 3-foot wide low water slots. The intake ogee weir has a crest elevation of 522 feet NGVD. Modification to the intake structure was completed in 1943.

This section will provide a description of the authority, background, alternatives considered and alternatives evaluation for the Toby Creek Impounding Basin.

2.1 Climate

The climate in this part of the Susquehanna River basin is temperate. The average annual temperature is approximately 49 degrees Fahrenheit, and the annual precipitation is approximately 40 inches. Cold winters with snow accumulation, spring thaws and runoff, and summer thunderstorms are common. This hydrometeorological pattern causes seasonally high water events as well as summer flooding. Occasional hurricanes or tropical storms may affect the basin and river levels, either directly or indirectly.

2.2 Land Use

The majority of the actions covered by this EA will be in the flood plain of the Susquehanna River. In this region, there are three main types of flood plain land uses:

- (1) Forested flood plains. These are mainly the flood-prone, riverine wetland areas that have not been converted to agriculture and subsequent urban land uses.
- (2) Flood plains that have been converted to agricultural land use. The typical condition for these areas includes active crop farming and some livestock management.
- (3) Flood plains that have infrastructure across the river (flood plain and channel) as well as throughout the flood plain. It is in these urbanized areas that most of the proposed actions will take place.

Current land use along the Susquehanna River, Wyoming Valley, is urban and suburban. Plans for cultural, economic, and recreational revitalization in Wilkes-Barre are evident in local brochures; however, actual designs and funding for these features have not progressed beyond preliminary planning stages.

2.3 Soils

For further information, reference the Phase II GDM/SEIS (1996) and the GRR/SEIS (2005). The soils in the Toby Creek Stream Valley are typical of the valleys that have tributaries to the Susquehanna River. The bedload of the creek is composed primarily of sands and coarse to fine gravels. There are some floodplain remnants inside the impounding basin but even these have been altered by past O&M activities within the basin. However, layers of depositional soils along the creek segment within the basin are still present, even though there has been alteration of the soils' upper stratum (top 18 inches)

2.4 Prime and Unique Farmlands

Prime farmland is available land that provides the best combination of physical and chemical characteristics for producing crops. Although these agricultural lands occur in Luzerne County, according to the Luzerne County Soil Survey, no prime or unique farmlands are located within the proposed project area. This area is totally enveloped by urban development on all sides.

2.5 Regional Geology and Topography

For further information, reference the 1996 Phase II GDM/SEIS and the 2005 GRR SEIS. The ancestral Susquehanna River valley was deepened by glaciation during the Pleistocene era, but when these glaciers receded, the valley was filled with clays, silts, sands, gravel, cobble, and boulders. The bedrock surface at the bottom of the valley is, at one point, about 300 feet below the present land surface. Abandoned underground coal mines have created subsidence of the valley floor in some areas.

The topography of the Toby Creek valley is characterized by a narrow, sloping flood plain (5-10% slopes) with moderately steep hills (greater than 20% slopes) on each side. Construction activities will occur, with the exception of the remedial seepage measures, in and immediately around the existing TCIB. This area was substantially altered from its natural state by the original construction of the TCIB. The construction area is predominately flat. There is no bedrock near the surface that would interfere with the construction.

2.6 Air Quality

Based on the Commonwealth of Pennsylvania Ambient Air Quality Monitoring Report (1999), the air quality in and surrounding Luzerne County can be assumed to be meeting health-based National Ambient Air Quality Standards (NAAQS). Ambient air quality is determined by measuring the ambient pollutant concentrations of particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, lead, and ozone. These concentrations are then compared to corresponding standards as determined by the U. S. Environmental Protection Agency. The closest monitoring site in Pennsylvania to Luzerne County is in adjacent Lackawanna County to the northeast. For the purposes of this environmental documentation, the conditions in Lackawanna County will be assumed to also occur in Luzerne County.

Pollutant	NAAQS Concentration	1999 Measured Concentration
Carbon monoxide (CO)	9 ppm, 8-hour average	3 ppm
Lead (Pb)	1.5 ug/m ³ , quarterly average	<0.25 ug/m ³
Nitrogen dioxide (NO ₂)	0.053 ppm, annual mean	<0.020 ppm
Ozone (O ₃)	0.120 ppm, 1-hour average	0.111 ppm
Particulate matter (PM ₁₀)	50 ug/m ³ , annual mean	12 ug/m ³
Sulfur dioxide (SO ₂)	0.030 ppm, annual mean	0.007 ppm

The ambient Air Quality data for the construction area is the same as documented previously in the 2005 Wyoming Valley GRR and SEIS, page 24 and that information is hereby incorporated by reference.

2.7 Streams

For further information, reference the 1996 Phase II GDM/SEIS and the 2005 Wyoming Valley GRR SEIS. No streams exist other than those that were documented in previous NEPA documents.

The Susquehanna River in the study area is listed as a warmwater recreational fishery for a majority of its length. From Ransom in Lackawanna County, through Wilkes-Barre and downstream to Selinsgrove in Snyder County this is the typical setting for a warmwater recreational fishery. The tributaries to this river vary in their quality and size. Some large tributaries, such as the Lackawanna River, have been degraded due to a variety of factors including urbanization, combined sewer overflows and abandoned mine land drainage (acid and metals).

There are numerous riffle and pool complexes along this portion of the Susquehanna River. The vast majority of the river channel will remain as it is today, and will not experience effects from either the physical construction of the levee raising project or from any of the non-structural actions. Since these habitat components are in a large river, the riffles are larger, with bigger stones and the pools are much deeper and longer than in a smaller tributary.

Toby Creek's main channel flows through the TCIB. The Creek is then piped in the pressure conduit for over a mile (6,000 linear feet+/-), then flows through the Woodward Pump station. It then daylight into the original Toby Creek channel and into the Susquehanna River. The creek has grassy and some taller emergent vegetation inside the TCIB.

2.8 Wetlands

For further information, reference the 1996 Phase II GDM SEIS and the 2005 Wyoming Valley GRR SEIS.

There are several different wetland types located in the general Wyoming Valley Levee Raising project area. These range from broad, flat forested and emergent wetlands located in the Susquehanna River flood plain to smaller, somewhat linear wetlands located along the tributaries to the river. Some of these wetlands exist in the urbanized landscape and some are located on agricultural lands. All of the above wetlands provide a variety of functions for both humans and the aquatic ecosystem. These functions vary by landscape setting. For instance, the flood plains along the Susquehanna River have three main functions of habitat, water quality and flood water attenuation. On the smaller tributaries, the wetlands serve as habitat corridors, for water quality filtration, and as groundwater discharge points.

A field visit was conducted by a wetland scientist in May 2005 to document the existing wetland resources in and around the TCIB. Field identification of wetlands was performed using the

criteria set forth in the 1987 Corps *Wetlands Delineation Manual*. In summary there are no wetlands in or around the area within the construction zone of the TCIB project and the areas in which the remedial seepage activities are anticipated to occur.

2.9 Wildlife

Typical animal species in the area include white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Scalopus aquaticus*), opossum (*Didelphis marsupialis*), striped skunk (*Mephitis mephitis*), and raccoon (*Procyon lotor*). Common bird species include American robin (*Turdus migratorius*), mallard ducks (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macroura*), woodpeckers (family Picidae), nuthatches (*Sitta sp.*), eastern bluebird (*Sialia sialis*), starlings (*Sturnus vulgaris*), black-capped chickadee (*Parus atricapillus*), northern cardinal (*Cardinalis cardinalis*), warblers (family Parulidae), and sparrows (family Fringillidae). A variety of amphibians and reptiles can also be found including Eastern garter (*Thamnophis sirtalis sirtalis*) and black rat (*Elaphe obsoleta obsoleta*) snakes; box (*Terrapene carolina carolina*), painted (*Chrysemys picta picta*), and snapping turtles (*Chelydra serpentina*); and green frog (*Rana clamitans melanota*), tree frog (*Hyla versicolor*), and American toad (*Bufo americanus*).

All of the species in the study area are numerous or common in Pennsylvania and are somewhat tolerant of human effects on the landscape. There is assumed to be general wildlife utilization of the TCIB area but this would be by species that are very tolerant of human activity and development, since the TCIB is surrounded by a neighborhood, roads and a railroad. The area therefore contains limited functional wildlife habitat. The area may serve generally as a migration corridor through the neighborhood from the river to the upper parts of the Toby Creek watershed.

2.10 Terrestrial Resources/Vegetation

For further information, reference the Phase II GDM/SEIS (1996) and the GRR SEIS (2005). Typical woody vegetation in the area includes such species as red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), river birch (*Betula nigra*) willow (*Salix sp.*), American elm (*Ulmus americana*), alder (*Alnus sp.*), sycamore (*Plantus occidentalis*), and pignut hickory (*Carya glabra*). The non-woody vegetation consists of common grasses (*Poa* and others) and typical flood plain vegetation.

2.11 Rare, Threatened, and Endangered Species

There are 15 known threatened or endangered species in Pennsylvania. An EA dated August 1998 documented coordination with U.S. Fish and Wildlife Service (USFWS) regarding potential impacts to the Federally-listed peregrine falcon (*Falco peregrinus*) and Indiana bat (*Myotis sodalis*). The peregrine falcon has since been removed (25 August 1999; Federal Register) from the endangered species list and it has been determined that habitat for the Indiana bat may be adequate in the Kirby Park Natural Area (USFWS letter dated 11 March 2002, As per

a letter dated October 4, 2005 from the PA Game Commission, the local peregrine falcons are still a state protected species.

Several reports have been prepared for activities in this project area. As a result of information received to date, it is not expected that there are any federally listed threatened and endangered species present.

2.12 Wild and Scenic Rivers/American Heritage River

There are no wild or scenic river designations in the TCIB project area. The Upper Susquehanna-Lackawanna River Watershed is listed as an American Heritage River per Executive Order 13061 on 11 September 1997. The Upper Susquehanna-Lackawanna Watershed, as delineated by the U.S. Geological Survey, comprises nearly 1,800 square miles of land and almost 1,600 miles of perennial rivers and streams. Lackawanna and Luzerne counties constitute the core of the watershed, which includes portions of several other counties and more than 150 municipalities. The corridor begins along the Lackawanna at Thompson, proceeds to the confluence of the Lackawanna with the Susquehanna at Pittston, and follows the Susquehanna through the Wyoming Valley to Sunbury. The watershed includes the Wyoming and Lackawanna Valleys, plus adjoining mountainous areas that provide headwaters for the numerous streams that flow to the Susquehanna River. Its major urban centers are Wilkes-Barre and Scranton. Other population centers within the watershed include Bloomsburg, Carbondale, Dickson City, Dunmore, Hazleton, Kingston, Nanticoke, and Pittston.

2.13 Cultural Resources

The entire Wyoming Valley Levee Raising project area was subject to a cultural resources survey in 1995. To accomplish this, the Corps conducted a geomorphological investigation to determine the most probable areas for archeological resources. As a result, alluvial and depositional flood plains were determined prime locations for buried archaeological resources.

It is not anticipated that the TCIB is listed as an historic structure. Furthermore, it is not anticipated that there would be any cultural resource impacts from any of the construction alternatives at the TCIB or from the remedial seepage measures. Coordination with the Pennsylvania SHPO is in process and will be finalized prior to the start of construction.

2.14 Hazardous, Toxic, and Radioactive Waste (HTRW)

For further information, reference the 1996 Phase II GDM SEIS and the 2005 GRR SEIS.

Although the project area is surrounded by the typical Wilkes-Barre neighborhood and small business development, the berm and the other pieces of the TCIB are the only area of construction and it is not anticipated that these will be a source of any contamination.

2.15 Aesthetics and Recreation

The general information contained in both the 1996 GDM SEIS and the 2005 GRR SEIS is hereby incorporated by reference.

As described in detail in the 2005 GRR SEIS, the riverfront area near the Courthouse will be the subject of a significant recreational investment over the next few years. This project includes large portals in the levee/floodwall system near the riverfront commons, an amphitheatre, a riverside landing, universally accessible fishing platform and other appurtenances in a riverfront park setting. There is very little recreational activity in or around the TCIB. Access is extremely limited due to the purpose of the facility.

2.16 Socio-Economic Setting

The socio-economic setting includes a review of regional demographics, economics, and education. Information is presented from Census 1990 because detailed information from Census 2000 will not be available until October 2002 per the U.S. Census Department web page. From the information presented below, environmental justice considerations and impacts are evaluated in Section 4.19.

2.16.1 Demographics The detailed information in the 1996 Phase II GDM SEIS and in the 2005 GRR & SEIS is hereby incorporated by reference.

2.16.2 Economics The detailed information in the 1996 Phase II GDM SEIS and in the 2005 GRR & SEIS is hereby incorporated by reference.

2.16.3 Education The detailed information in the 1996 Phase II GDM SEIS and in the 2005 GRR & SEIS is hereby incorporated by reference.

2.17 Noise

The detailed information in the 1996 Phase II GDM SEIS and in the 2005 GRR & SEIS (Section 3.10, page 32-33) is hereby incorporated by reference.

Ambient noise levels through the TCIB area vary. In general though, the ambient noise levels are low. At times, there may be distant highway noise from traffic along the Susquehanna River valley. Also, there are some commercial activities around the exterior and adjacent to the TCIB. There is a state road running across the creek just upstream of the basin and there is a residential area and railroad along the other side of the basin.

2.18 Infrastructure, Public Services, and Safety

2.18.1 Roads and Transportation. For further information, reference the 1996 Phase II GDM SEIS and the 2005 GRR SEIS. The traffic patterns throughout the study area are confined to the transportation corridors along the highways and towns. Specifically around the TCIB, there is a state highway, Rt. 309 (aka the Cross Valley Expressway) crossing the Creek near the upstream end of the TCIB. There are a number of neighborhood roads around the basin. There is also an abandoned railroad track along the eastern edge of the basin.

2.18.2 Public Facilities. For further information, reference the 1996 Phase II GDM SEIS and the 2005 GRR SEIS. There are many utilities, public and private, located throughout the

Wyoming Valley project area. Specific infrastructure around this TCIB includes underground and overhead utilities. Most of these are either below or far enough away from the original TCIB that they are not close enough to conflict with the rehabilitation of the structure.

2.19 Safety to Children

Executive Order 13045 (Protection of Children from Health Risks and Safety) requires federal agencies to evaluate the impacts of their proposed activities on children.

3.0 ALTERNATIVES EVALUATION

The alternatives evaluation will describe potential actions that are reimbursable. The actual alternatives evaluation was conducted in previous NEPA documents, as was discussed above. An alternatives evaluation will be presented for the relief culvert, stability berm, and access path modifications.

3.1 No Action

3.2 Alternative 2: Interior Raising

- Interior Raising: An interior raising would minimize or eliminate the need to acquire any additional real-estate. However, it would encroach into the impounding basin and reduce the available volume for storage. In addition, the exterior slope would still need to be disturbed and flattened to establish a 2.5 horizontal on 1 vertical slope and to remove the existing trees. Furthermore, a significant portion of the exterior embankment would still have to be excavated to install the internal drain.

3.3 Alternative 3: Exterior Raising

- Exterior Raising: An exterior raising will require real estate acquisition along the east side of the basin. Only the exterior side of the embankment would be disturbed by construction. In addition, very little of the exterior embankment would have to be completely excavated to install the internal drain since most of the internal-blanket drain would be located within and beneath the new raised embankment section. The exterior raising would require less material to construct the new embankment and significantly reduce the amount of excavation for the internal sand drain.

3.4 Alternative 4: Straddle Raising

- Straddle Raising: The advantages and disadvantages for the straddle raising would be very similar to those for the interior raising.

3.5 Alternative 5: Combination Raising (Proposed Action)

- Combination Interior/Exterior Raising: Predominantly an exterior raising but transitioning to an interior raising as necessary to minimize real estate impacts. Plate 2 shows the Preferred Plan of this type of raising.

- Up to 10,000 square feet of stone could be placed along two 1,000 foot reaches at the very upstream end of the Toby Creek impoundment basin. There is the possibility of significantly reducing or even eliminating this impact but this will not be known until the details of final design are known. If the stream channel section on the east side needs to be reduced then it is most likely that a corresponding area on the west will be provided to maintain the existing conveyance of the stream channel. In total, up to 15,000 square feet of stream bottom will be permanently covered with stone.

The recommended or selected plan for modifying the Toby Creek Impounding Basin was not entirely based on cost and engineering considerations. Various other concerns, such as real-estate, environmental, and impacts to adjacent communities were evaluated and considered in determining the most appropriate plan. Discussions of these various items are provided in the main letter report text.

As indicated in the Engineering Appendix of the Letter Report there still is a fair amount of design and analyses that must be completed before the selected approach for modifying the TCIB can be finalized. During the investigation and design phases, conditions may be revealed that require altering the recommended plan presented herein. Any significant changes would be addressed in additional NEPA documentation if necessary.

3.6 Alternative 6: Wall Raising

- **Wall Raising:** Raising the embankment using some type of floodwall structure would be very expensive. The 3.6-foot raising could be accomplished by installing a sheet piling cantilever wall along the crest of the existing embankment. Nevertheless, the existing exterior slope would still need to be disturbed and flattened to establish a 2.5 horizontal on 1 vertical slope; and a significant portion of the exterior embankment would still have to be excavated to install the internal drain and the embankment reconstructed. However, there does appear to be a 300-foot long reach at the northeast corner of the impounding basin where a small wall would be feasible due to the very limited space for an exterior raising. Along this reach, the existing embankment is less than 8 feet high, with several homes very close to the embankment toe. A straddle raising along this reach with 2H:1V interior slopes armored with riprap and the typical 2.5H:1V slopes along the exterior side may suffice. The necessity of a wall along this reach will be determined during the final design. Three wall types can be considered for this reach:
 - The first floodwall alternative is steel sheet piling. For a 3.6 foot cantilever “stick-up”, it is anticipated that approximately 10’ of embedment would be required. Therefore the sheet pile wall would consist of 15’ long PZ-22 sheet piling. The upper 5’ of piling would be painted with a primer, two coats of epoxy, and a topcoat of urethane.
 - The second floodwall alternative would consist of a typical concrete “T-wall”. Approximate sectional dimensions would be an 8’-0”x1’-6” footing with a 6’-

6"x1'-0" wall. The upper 4' of the concrete wall would be painted with 3 coats of an anti-graffiti paint system.

- The third alternative would consist of raising the embankment on the exterior side with earth; however to retain the fill from extending much beyond the limits of the existing embankment toe, a 5-foot high MSE wall would be constructed along the exterior toe of the embankment.

In addition to the proposed alternatives for raising the embankment, consideration was also given to realigning a reach of the embankment along the west side located between the spillway and the intake structure for the pressure conduit. There is room to move the embankment towards the exterior side. This realignment would provide some additional volumetric capacity for the basin; however, the benefit may be minimal and additional H&H analysis would be needed to determine the actual benefits.

The recommended or selected plan for modifying the Toby Creek Impounding Basin was not entirely based on cost and engineering considerations. Various other concerns, such as real-estate, environmental, and impacts to adjacent communities were evaluated and considered in determining the most appropriate plan. Discussions of these various items are provided in the main letter report text.

The recommended plan is the exterior raising for a majority of the embankment raising; however, in certain small restricted reaches, such as along the northeast end of the basin, a straddle or interior raising will be used to reduce the impacts to adjacent properties.

For the spillway, the plan selected is the RCC broad crested weir overlay spillway, which consists of placing stair-stepped layers of RCC to create a broad crested weir overflow section and discharge channel on the downstream embankment slope. Due to the limited removal of existing embankment (above current spillway elevation), a temporary cofferdam is not required for this alternative. The selected plan may also include a low embankment or grading and fill along the southeast corner of the basin to prevent overflow from the spillway into the low area of the Borough of Pringle.

SEEPAGE CONTROL MEASURES AT OTHER LOCATIONS

The seepage measures described below are considered ordinary activities for a project like Toby Creek. The projects are expected to occur independently of which of the TCIB modification alternatives are selected. These are necessary actions and are likely to be undertaken within the next few years if sufficient funding is available. Graphics are available in Attachment A.

Since the completion of raising the levees, there have been several high river events. During these events, excess seepage and small sand boils have been observed along various reaches of the project. Provided in Attachment A is more detailed information on the proposed remedial seepage control measures for these reaches. Below is a description of the problems and the recommended remedial investigation and repairs.

- Kingston/Edwardsville downstream of Church Pump Station: Seepage and small sand boil have occurred beyond the toe of the berm. The remedial action is to install a trench drain and collector pipe for relief wells.
- Swoyersville/Forty Fort adjacent to airport runway in vicinity of Station 220+00. Seepage and small sand boil have occurred beyond toe of berm. The remedial action is to install a small seepage berm and/or possibility some relief wells.
- Swoyersville/Forty Fort existing seepage berm. The remedial action is to investigate the blockage of the berm toe and drain and if it is blocked then to install finger drains.
- Kingston/Edwardsville, Kirby Park: Investigation of wet spot on slope.
- Plymouth, near Flat Street ramp: Investigation of wet spot and seepage at toe of levee. The remedial action is to install a small toe drain to collect seepage.
- Wilkes-Barre/Hanover, vicinity of water tunnel: Seepage along toe. The remedial action is to install a small berm and/or relief wells.
- Wilkes-Barre/Hanover, downstream of Delaney Street Pump Station. During the June 2006 flood event, a sinkhole developed landward of the levee toe, which was caused by the failure of the 30" corrugated metal pipe (CMP) that collects the flow from the relief wells downstream of the Delaney Street Pump Station. The failure of the pipe allowed large amounts of foundation materials to flow into the pipe, creating large voids around and beneath the pipe, which caused additional damaged to the 30" diameter pipe. Several options were evaluated. The most cost effective remedial option would be to install several new relief wells at the toe of the levee berm and abandoned the damaged collector pipe and existing relief well system.

In order to develop a cost for each of these remedial seepage repairs, a concept fix was selected and appropriate cost estimate developed for each location/fix

3.7 Spillway Alternatives.

Based on the H&H analysis, the spillway crest will need to be raised to elevation 569.2 feet NGVD to contain the 100-year event. The H&H analysis also showed that the maximum PMF water surface in the impounding basin would reach elevation 573.6 feet NGVD, which is 4.4 feet above the proposed spillway crest elevation. This would provide a maximum PMF flow over the spillway of approximately 3,100 cfs. As stated above, the existing spillway has been raised on 2 separate occasions. Based on the inspection of the spillway and review of the design documents it may be possible to raise this spillway again. For the proposed project, 3 different types of new spillways were also evaluated. Furthermore, several locations for the new spillway were also considered. For all the new spillway alternatives, the existing spillway would have to remain operational until the new spillway is constructed. Upon completion of the new spillway, appropriate portions of the existing spillway and training walls would be demolished and

removed. The remaining portions of the existing spillway would be buried beneath the new embankment.

Three different types of new spillways were evaluated – a reinforced concrete ogee weir similar to the existing ogee spillway, a monolithic roller compacted concrete (RCC) broad-crested weir, and a RCC broad-crested weir overlay spillway. Concept section for the RCC Overlay Section is shown on Plate 5 of SEIS.

- Ogee Weir Spillway: An ogee weir spillway would be constructed of reinforced concrete with reinforced concrete training walls and discharge apron with baffle blocks. This design would mimic the original spillway geometry with sizes of elements adjusted to accommodate the proposed embankment raising and the existing grades. A temporary cofferdam would be required due to major embankment removal for construction.
 - Monolithic RCC broad-crested weir: Similar to the above ogee weir, the RCC spillway would be a massive gravity structure. The spillway chute would consist of steps down to the downstream apron slab, which would also be constructed of RCC. The training walls could be designed and constructed using either RCC or reinforced concrete. A temporary cofferdam would be required as above.
 - RCC broad crested weir overlay spillway: This alternative involves removing only the upper portion of the embankment (above current spillway elevation) and placing stair-stepped layers of RCC to create a broad crested weir overflow section and discharge channel. Due to the limited removal of existing embankment, a temporary cofferdam is not required for this alternative. It is assumed that the RCC can be stepped both in the direction of flow and perpendicular to the flow to eliminate the need for reinforced concrete retaining/training walls.
- Modifying & Raising Existing Spillway: Several different types of modification schemes were evaluated. The modified or raised section for the spillway could be constructed using reinforced concrete or RCC. One option would be to place a new section for the spillway on the interior side of the existing spillway structure. The existing retaining walls on either side would be uncovered and then raised using reinforced concrete or RCC. A coffer dam, which is described below, would be required to protect the work area while modifications are made to the spillway structural. In addition, it may be necessary to provide a temporary spillway, consist of a concrete mattresses (or articulated concrete block, ACB) placed on top of the existing embankment. The elevation of the temporary spillway would be at or slightly higher than the existing spillway elevation. It may also be desirable to raise and modify the existing embankment prior to modification.
 - Spillway Location: Several possible locations for the new spillway structure were considered. The location of the spillway has major impacts on real-estate issues and directly determines whether a coffer dam is needed or not. The two preferred locations for the new spillway are shown on Plate 2 of SEIS, as well as property lines and adjacent buildings. As shown on Plate 1 of SEIS, the existing spillway is located along the west side of the basin in a southwestern orientation. At the southern end or nose of the impounding basin, the exterior toe of the existing embankment is close to the property

line; furthermore, the adjacent ground surface outside the property line is higher due to the railroad bed embankment. This condition creates a very restricted area to channel the flow from the existing spillway. The main requirement for locating a new spillway, as directed by the Pennsylvania Department of Environmental Protection – Dam Safety Division is that discharge flow from the spillway must follow the same flow path (area and direction) as it leaves the site that it now follows. Consequently, there are only 2 locations where a new spillway can be located to meet the above requirements, which are described below:

- Area A: The spillway would be located somewhere along the southwest side of the basin between the pressure conduit intake structure and the existing spillway. The disadvantage is that some partial acquisition of adjacent real-estate properties, and construction of a small retaining along the adjacent properties, would be necessary to provide the same channel widths that now exist to discharge spillway flow away from the site and the embankment toe. One scheme assumes that the new spillway structure would be located within the limits of the existing embankment, which would require excavating a good portion of the embankment and providing some type of coffer dam, which is discussed below. Constructing the new spillway structure within the foot print of the existing embankment would not significantly increase or change the stresses within the foundation beneath the embankment since the loads for the new concrete spillway structure would be similar to those loads from existing earth embankment. Therefore, differential settlement would not be a concern. Another scheme would be to construct the new spillway outside the existing embankment near the exterior toe, which would eliminate the need for a coffer dam. This could be accomplished by realigning a reach of the embankment along the west side. There is room to move the embankment towards the exterior side. This realignment would provide some additional volumetric capacity for the basin; however, this realignment would increase the cost. In addition, the foundation would experience new loading conditions for the new spillway and embankment realignment, which would require detailed analysis.
- Area B: The second location for the new spillway would be at the south end or nose of the basin. The actual location would depend on the type of spillway structure. The RCC overlay spillway could be located almost anywhere along the south end. However, it would be desirable not to locate the reinforced concrete ogee weir and the monolithic RCC broad crested weir type spillways directly over the existing pressure conduit. Positioning these massive structures on top of the conduit would require extensive analyses of the foundation and conduit. Locating the new spillway at the nose of the basin would cause no change to the course and direction of the discharge flow from the spillway as it leaves the site. However, the main disadvantage would be the possible adverse affects to the discharge characteristics of the conduit intake structure by locating the new spillway in the close proximity to the existing conduit intake structure. Additional H&H analyses would be required to determine any impacts to the intake structure discharge.

Based on the June 2006 flood event, it appears that discharge from the spillway quickly flooded the low area directly adjacent to the southeast corner of the basin, where several homes were flooded. The railroad embankment, located south of the basin, did prevent overflow from heading south into Kingston; however, the railroad embankment directed a portion of the overflow westward along the railroad embankment, which impacted several residential and commercial properties along the southwest corner of the basin. In addition, the design will also need to possibly consider redirecting flow or preventing flooding from the low area at the southeast corner in Borough of Pringle. This may require some type of training wall or embankment which would direct flow away from the low area in Pringle.

- **Coffer Dam:** If the location of the new spillway structure is within the limits of the existing embankment, a temporary cofferdam would be required to prevent uncontrolled releases. It is anticipated that the cofferdam would be 150' in length and that steel sheet piling would be used to construct this cofferdam. The required height of the sheets above grade would be approx. 23'. It is estimated that 40' sheets would be used and that during a high water event, the Contractor would be required to place loose backfill against the landside of the sheets to match the rise of the water within the basin. As the water level goes down, the backfill would be removed. However, a coffer dam may not be required for the construction of a new RCC overlay spillway. This type of spillway would involve removing only the upper portion of the embankment (above current spillway el) and placing stair-stepped layers of RCC to create an overflow section and discharge channel.

SELECTED PLAN

The recommended or selected plan for modifying the Toby Creek Impounding Basin was not entirely based on cost and engineering considerations. Various other concerns, such as real-estate, environmental, and impacts to adjacent communities were evaluated and considered in determining the most appropriate plan. Discussions of these various items will be provided in the main letter report text.

The recommended plan is the exterior raising for a majority of the embankment raising; however, in certain small restricted reaches, such as along the northeast end of the basin, a straddle or interior raising will be used to reduce the impacts to adjacent properties.

For the spillway, the selected plan is to modify the existing spillway by placing a new structural on the interior side of the existing spillway using either RCC or reinforced concrete. The selected plan also includes a low embankment along the southeast corner of the basin to prevent overflow from the spillway into the low area of the Borough of Pringle. As stated in this report and presented below, there is still a good deal of design and analyses that must be completed before the approach and schemes for modifying the TCIB can be finalized. During the investigation and design phases, conditions may be revealed that require altering the recommended plan presented herein. However, the purpose of this report was to provide several feasible alternatives that could be built if problems and concerns were discovered with the selected plan.

4.0 IMPACTS EVALUATION (TCIB)

4.1 Climate

There will be no temporary, long-term, adverse, or significant impacts on the climate of the study area from any of the actions evaluated in this EA.

4.2 Land Use

There will be no adverse effect on local land use.

4.3 Soils

For further information, reference the 1996 Phase II GDM SEIS and the 2005 GRR SEIS. No long-term, adverse, or significant impacts to soil composition are anticipated from the TCIB rehabilitation.

4.4 Prime and Unique Farmlands

No long-term or significant impacts are anticipated to this resource from any of the actions evaluated in this EA.

4.5 Geology and Topography

No long-term or significant impacts are anticipated to this resource from any of the actions evaluated in this EA.

4.6 Air Quality

The Air Quality data and analysis found on p. 134 in the 2005 GRR SEIS is hereby incorporated by reference. The calculations for the construction of the TCIB rehabilitation will have temporary construction emissions and no permanent emissions. Emissions from the activities described in this EA will be at the de minimus level. No long-term or significant impacts to the flow of air or to air quality are anticipated.

4.7 Streams

Neither the temporary nor the permanent impacts proposed in this EA will significantly impact the existing creek. The creek in and around the project area has been urbanized and altered mechanically (some past impacts due to local sponsor O&M activities) and is not considered high quality aquatic habitat.

The proposed project will need to have efficient construction access within the basin. This access and related activities will require temporary stream crossings (using fill materials such as gravel), pipes for stream conveyance during construction, filter cloth and other typical materials for temporary stream crossings. It is anticipated that there will be no more than two crossings needed within the basin. Temporary impacts to the stream will also include the excavation of gravel from within the basin and stream channel to restore the flood protection benefits of the

basin. Some of this accumulated bed load may also be used as fill materials for construction. When finished, these temporary construction features will be removed and the site stabilized.

Permanent stream impacts will also be necessary as a part of the rehabilitation of the basin. This will entail the placement of a minor amount of riprap in approximately 1,000 feet of the creek channel at the extreme upstream end of the construction site, where the creek comes out of the culvert under Route 309 (Crossvalley Expressway). Although the current plan is to riprap the entire cross section of the stream at this location, during detailed design it is anticipated that the cross section can be pulled back to only impact the stream banks. Currently the stream banks have riprap that was placed approximately 20 years ago.

No significant or adverse impacts to streams are anticipated as a result of the access path modifications. It is expected that although the bottom will be covered by rocks, within two years after construction the natural bedload is expected to cover the placed rocks and the benthic community is expected to return. At the very upstream end of the TCIB riprap and stone will be placed across the creek which is approximately 200 feet long and 50 feet wide. Upstream of and adjacent to the pressure conduit the stream will be covered with stone. The length of this area that will be covered is approximately 100 feet and the width of the stream at this point is approximately 50 feet. In total up to 15,000 square feet of stream bottom will be covered with rock. Coordination as part of the Commonwealth's Chapter 105 environmental permitting process will be undertaken with the Commonwealth of Pennsylvania Department of Environmental Protection to obtain any necessary permits related to sediment control and discharge into waterways. The recommended plan is the exterior raising for a majority (80-90 percent) embankment raising; however, in certain small restricted reaches, such as along the northeast end of the basin, a straddle or interior raising will be used to reduce the impacts to adjacent properties. The east bank at the very upstream end of Toby Creek inside the basin (left bank looking downstream from the culvert) is the area most likely to have some level of impacts due to the proposed actions. The west side can be adjusted to accommodating the rip rapping but, activity on the east side is restricted by the presence of residential and commercial real estate along the outside toe of the existing embankment. Up to 10,000 square feet of stone could be placed along a 1,000 foot reach that is five feet wide on each slope. There is the possibility of significantly reducing or even eliminating this impact but this will not be known until the details of final design are known. If the stream channel section on the east side needs to be reduced then it is most likely that a corresponding area on the west will be provided to maintain the existing conveyance of the stream channel. (See Figure labeled "Streambed") for a graphic that shows this in detail.

4.8 Wetlands

There are no wetlands in our around the outside of the TCIB, therefore, the project will have no wetland impacts. None of the seepage remediation projects will have wetlands impacts.

4.9 Wildlife

All of the species in the study area are numerous or common in Pennsylvania and are somewhat tolerant of human effects on the landscape. As previously mentioned, the majority of the project

area is in an urban setting and will not likely have any actions undertaken to abate flooding effects.

4.10 Terrestrial Resources/Vegetation

Although there are some second or third growth trees on the exterior side of the embankments of this basin, these are presenting a risk to the earthen berms and must be removed. These trees are of low quality due mainly to the species and the immature age. No long-term or significant impacts are anticipated as a result of the actions evaluated in this EA.

4.11 Rare, Threatened, and Endangered Species

No long-term or significant impacts are anticipated to any state or Federally-listed or proposed for listing species. This specific action is being coordinated with the USFWS State College field office, the PA Fish and Boat Commission and the PA Game Commission by means of this EA for concurrence that this project will not affect any protected species.

4.12 Wild and Scenic Rivers/American Heritage River

As part of the American Heritage River Action Plan for the Upper Susquehanna-Lackawanna River Watershed, this flood protection project, modification to, or other actions not jeopardizing the flood protection intent, will not significantly impact the national designation or future funding. As excerpted from the Action Plan,

[t]he community vision developed for the Upper Susquehanna-Lackawanna Watershed encompasses several major elements. First, a comprehensive study of the watershed's ecosystem should be undertaken to determine how this large restoration initiative could be most effective and efficient. The most pressing environmental problem in the region may be the acid mine drainage produced by abandoned coal mines. This acid mine drainage has a variety of harmful effects beyond the watershed -- it is the largest source of industrial pollution in the Chesapeake Bay and it prevents the free migration of the American Shad from the Chesapeake Bay to the headwaters of the Susquehanna. Innovative acid mine drainage abatement projects, such as the creation of artificial wetlands along streams and creeks that feed into the Susquehanna River, could alleviate this problem.

The second major obstacle to the environmental and economic revitalization of the region is the countless acres of mine-scarred land left from decades-old mining practices. In addition to being an environmental blight and a health and safety risk, the prevalence of this mine-scarred land inhibits economic development. As the region runs out of suitable land for industrial development, pristine "greenfields" are a prime target for development. Potential solutions include a revolving fund to support continuing reclamation efforts and a brownfields-like demonstration project to reclaim mine-scarred land so that the land will be suitable for industrial development. At the same time, as a region

which suffered in 1972 a flood that was the worst natural disaster in American history (at that time), flood protection should be expanded by employing, where practical, innovative and nonstructural solutions.

It is not anticipated that any of the actions will have or had a negative effect on the listing documentation and goals for this American Heritage River. The Susquehanna River is not part of the Wild and Scenic River system, nor has it been designated as a study river by Congress. Therefore, there will be no impacts in this category from any of the actions evaluated in this EA.

4.13 Cultural Resources

For further information, reference the 1996 Phase II GDM SEIS and the 2005 SEIS. No additional long-term or significant impacts are anticipated as a result of the actions evaluated in this EA. Due to the urbanized setting of the TCIB, the fact that the structure has existed here for 40 years and the cultural resources compliance conducted for both the 1996 SEIS and the 2005 SEIS, the Corps has made a determination of no affect on cultural resources either listed or eligible for listing on the National Register of Historic Places. This determination is currently being coordinated with the PA SHPO's office for concurrence.

Should the action be determined to have an effect on cultural resources, the project proponent must obtain PHMC clearance prior to the consideration of a reimbursement request by the Corps.

4.14 Hazardous, Toxic, and Radioactive Waste

According to a search on Environmental Protection Agency's Envirofacts database, there are numerous locations of concern in the study area for this EA. Project activities covered in this EA will occur only in the previously constructed TCIB and the berm. Consequently no long-term, adverse, or significant impacts are anticipated as a result of any of the actions evaluated in this EA.

4.15 Aesthetics and Recreation

For further information, reference the 1996 Phase II GDM SEIS and the 2005 SEIS. No long-term or significant impacts are anticipated as part of the modifications covered in this EA.

4.16 Socio-Economic Setting

No long-term or significant impacts are anticipated from any of the actions evaluated in this EA.

4.17 Noise

Construction is anticipated to occur during normal daytime hours. The noise generated will be typical of large and small machinery around a construction site. Bulldozers, backhoes, graders, and rollers will be used during the construction and truck traffic for the delivery of materials will also occur. A majority of this traffic will use local roads and will be found within the basin with only some machinery moving around the outside of the basin during construction for grading and clearing of vegetation. This traffic will be a short term noise generator and will cease after

construction. It is anticipated that it will take one full construction season (9-12 months) to build the project. Adverse weather could push this to two seasons. No long-term negative or significant impacts from noise are expected as a result of the proposed action.

4.18 Infrastructure, Public Services, and Safety

4.18.1 Roads and Transportation. In general, there will not be a conflict between these actions and major sources of traffic since most of the study area is rural or lightly urbanized and most of the action will occur in the flood plain, away from major traffic locations. The exceptions may be in the urbanized areas where construction access may occur on existing road networks. For further information, reference the 1996 Phase II GDM SEIS.

Other than minor local traffic diversions or the occasional temporary street closure, it is not anticipated that these actions will result in adverse impacts on traffic patterns, volumes, or flows. The truck traffic will most likely be routed either on roads or within the basin or parallel with the railroad bed to gain access to the “nose” of the basin, where the creek flows into the pressure conduit.

4.18.2 Public Facilities. For further information, reference the 1996 Phase II GDM SEIS and 2005 GRR SEIS. There are no adverse or significant impacts anticipated from any of the actions evaluated in this EA.

4.18.3 Public Safety and Flood Protection. For further information, reference the 1996 Phase II GDM/SEIS and the 2005 SEIS. No negative impacts to public safety and flooding are expected.

On 24 May 1977, President Carter issued Executive Order (E.O.) 11988 “Flood plain Management”. This E.O. requires Federal agencies to provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains.

This rehabilitation of this TCIB will sustain flood protection for much of the local community surrounding the basin.

4.19 Environmental Justice

On 11 February 1994, President Clinton issued E.O. 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” The E.O. requires Federal agencies to identify and address any disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

As defined by the “Draft Guidance for Addressing Environmental Justice Under NEPA” (CEQ, 1996), “minority” includes persons who identify themselves as Asian or Pacific Islander, Native American or Alaskan Native, black (not of Hispanic origin) or Hispanic. A minority population exists where the percentage of minorities in an affected area either exceeds 50% or is meaningfully greater than in the general population. Low-income populations are identified

using the Census Bureau's statistical poverty threshold, which is based on income and family size. The Census Bureau defines a "poverty area" as a Census tract with 20% or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40% or more below the poverty level (Census Bureau, 1995).

The municipalities subject to the actions at TCIB do not fall into these categories, as described in Section 4. The actions will take place in areas subject to increased flooding as a result of the Wyoming Valley project, irrespective of the income level of the landowners or municipalities involved. No long-term or significant impacts are anticipated from any of the actions evaluated in this EA. For further information, reference the 1996 Phase II GDM SEIS and the 2005 GRR SEIS.

4.20 Safety to Children

No impacts to children are anticipated as access to the TCIB is extremely limited and the seepage remediation activities are small scale, of short duration, and routine. Due to past incidents at the basin, the issue of public safety and specifically children's safety is being strongly considered during the planning and design process. Many options for precluding access into the basin exist and are being evaluated. The opening of the pressure conduit cannot be blocked by fencing due to the debris load that comes down the creek during and after storm events. Some sort of exclusionary fencing around the perimeter of the basin may be the best option. At the current level of design detail, the type of devices to prevent access into the basin by foot or by vehicles has not been determined. This decision will be made during detailed design.

IMPACTS EVALUATION (Remedial Seepage activities)

These impacts would be very small in scale. The work will include installation of seepage berms, toe-drains, and relief wells. A summary of the impacts that would result are described below:

- The toe drain will require removal and reconstruction of a toe drain consisting of 3,000 cubic yards of material and the acquisition of ten feet of the berm in front of the nearby nursing home for inclusion into the project. The excavated material will be transported to a permitted placement site. At other areas approximately 10,000 cubic yards of seepage berm material will be placed. Relief wells be installed at other locations. This is considered in the Letter Report # 4 Real Estate Appendix and is not expected to be costly or difficult to implement. The remaining remedial actions are minor excavations and installation of small test pits.

4.21 Cumulative Effects

The Council on Environmental Quality's (CEQ) regulations (40 CFR 1500-1508) implementing the procedural provisions of NEPA of 1969, as amended (42 U.S.C. 4321 et seq.), define cumulative effects as,

[t]he impact on the environment which results from the incremental impacts of the

action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7).

Actions by Federal and non-Federal entities that are (1) in the reasonably foreseeable future or can be reasonably forecasted, (2) planned, or (3) on-going in the Wyoming Valley area are summarized below with a brief description of potential impacts.

- Wyoming Valley Levee Raising Project

In a memorandum dated 8 November 2000, the Assistant Secretary of the Army for Civil Works forwarded a letter to Congressman Paul Kanjorski (PA-11) regarding modifications to the Wyoming Valley Levee Raising Project. The Assistant Secretary of the Army for Civil Works informed Congressman Kanjorski that “all necessary evaluations and modifications to all elements of the existing flood control projects, which include Coal Creek, Toby Creek, Abrahams Creek, and various relief culverts and penetrations through the levee” are within existing Corps’ authority provided that these features are found to be technically feasible, environmentally acceptable, and economically justified.

- Wyoming Valley Inflatable Structure. This is subject of on-going Regulatory permit evaluation. Additional informational information from the local sponsor has been requested by the Baltimore District’s Regulatory Branch.

- A PL 84-99 June 2006 flooding report is presently at Corps of Engineers headquarters to remove 15,000 cubic yards of storm related debris at the TCIB. The Rehabilitation and Inspection Program (RIP) component of PL 84-99 allows the Corps to inspect the FDR projects annually to ensure that the local sponsors are maintaining the projects. More specifically, the RIP allows the Corps to repair eligible flood damages to FDR projects’ pre-flood conditions.

- Susquehanna River Landing/Riverfront Recreational Enhancements. These actions were the subject of the 2005 SEIS and the impacts were covered therein.

5.0 COORDINATION

In compliance with the NEPA requirements, public involvement and agency coordination is being initiated for the proposed actions by means of this Letter Report Four EA. It should be noted that the Baltimore District has been coordinating with agencies and citizens since the 1980’s on projects in this area.

A notice of availability (NOA) stating that this EA is available for a 30-day public review is being distributed at the time of the public release of this EA. It is expected that coordination with the public and agencies will result from the release of this draft EA and comments received will be addressed accordingly. Media outlets will also be contacted. This EA will be posted on the District’s web site at www.nab.usace.army.mil/PN/CivilWorks.htm under the public information button.

6.0 CONCLUSIONS

This EA has been prepared to minimize and evaluate unavoidable impacts to the environment associated with rehabilitation of the Toby Creek Impounding Basin. The project will ensure long-term flood protection and will ensure public safety downstream of the TCIB.

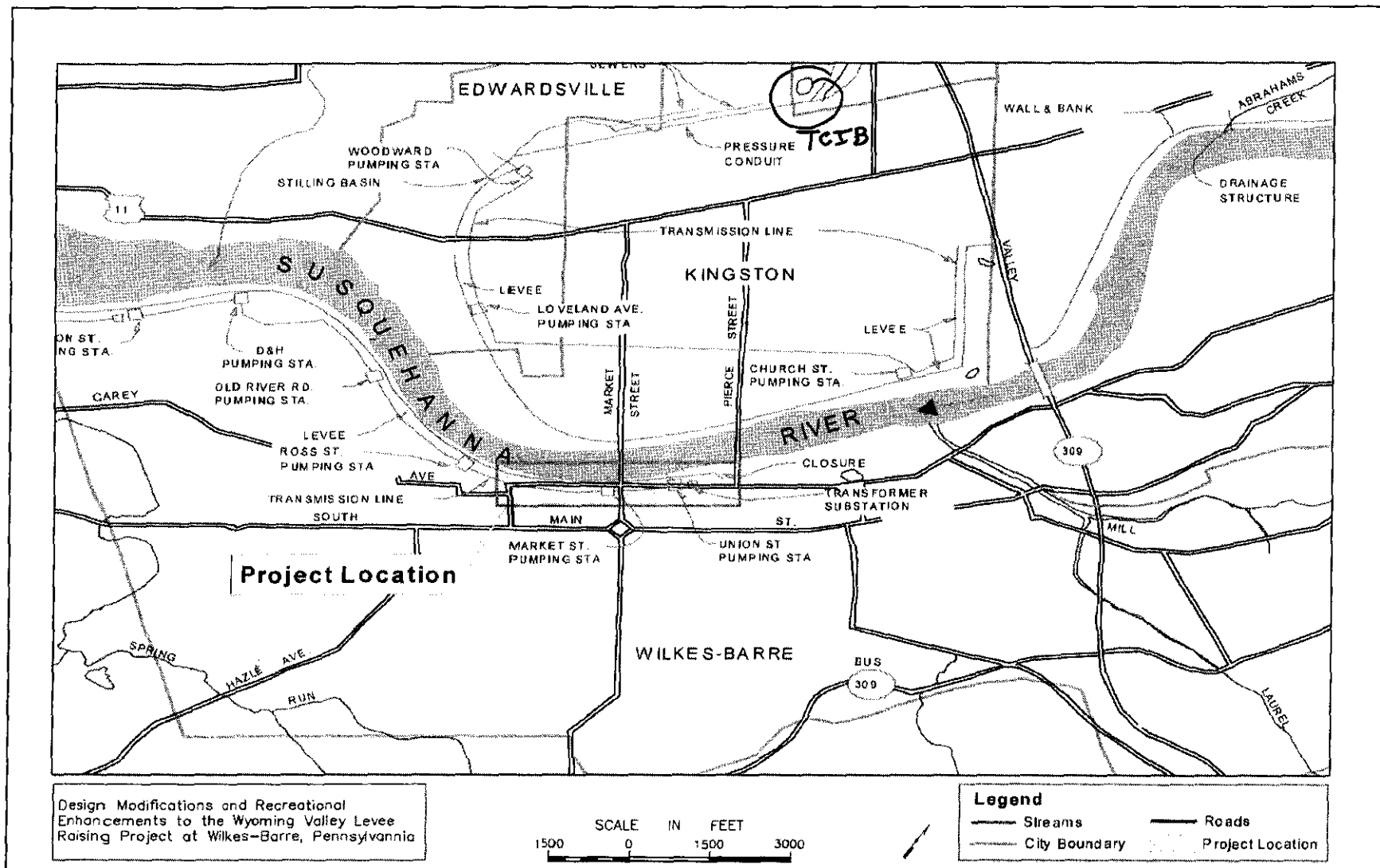
The remedial seepage impacts would be very small in scale. Work at the Kingston/Edwardsville downstream of Church Pump Station will require removal of 3,000 cubic yards of material to a permitted site and the acquisition of ten feet of the berm in front of the nearby nursing home for inclusion into the project. This is considered in the Letter Report # 4 Real Estate Appendix and is not expected to be costly or difficult to implement. The remaining remedial actions are minor excavations and installation of small test pits.

Impacts from the proposed actions will not be adverse or significant, either individually or cumulatively. The proposed actions have been coordinated with other concerned agencies and the public. Comments received in response to this coordination and other communications are included in the EA.

It is assumed that a FONSI will be the final NEPA documentation prior to implementing the action evaluated in this EA.

ATTACHMENT A

Project
Figure 2. Project Location



47



SUSQUEHANNA RIVER BASIN
KINGSTON-EDWARDSVILLE, PA.
GENERAL PLAN & SECTION

REVISED: SEPTEMBER 1988

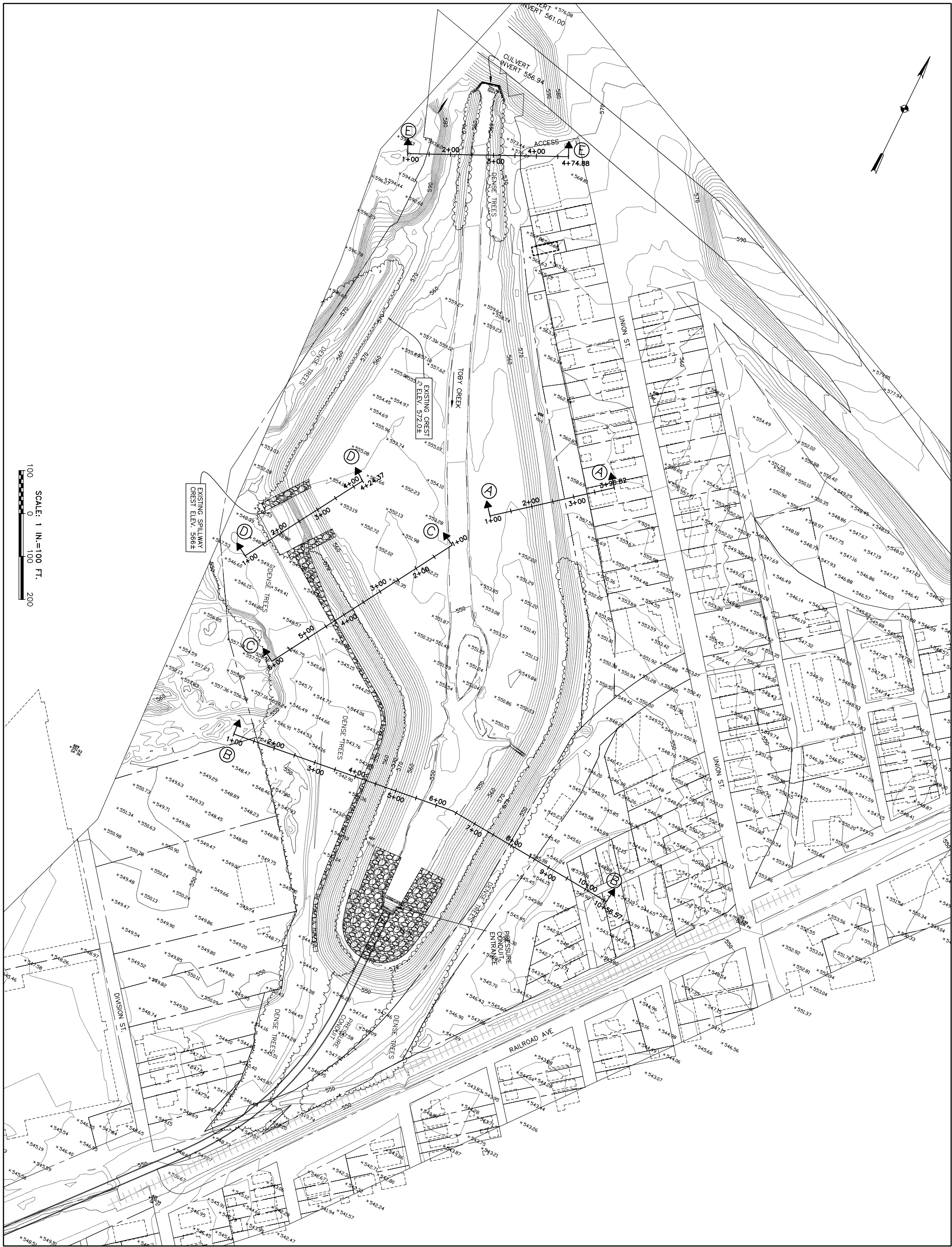
SUSQUEHANNA RIVER

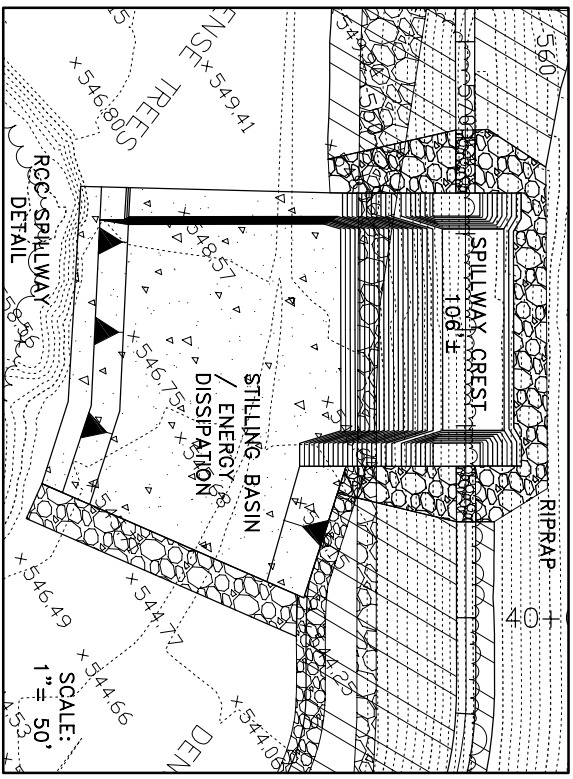
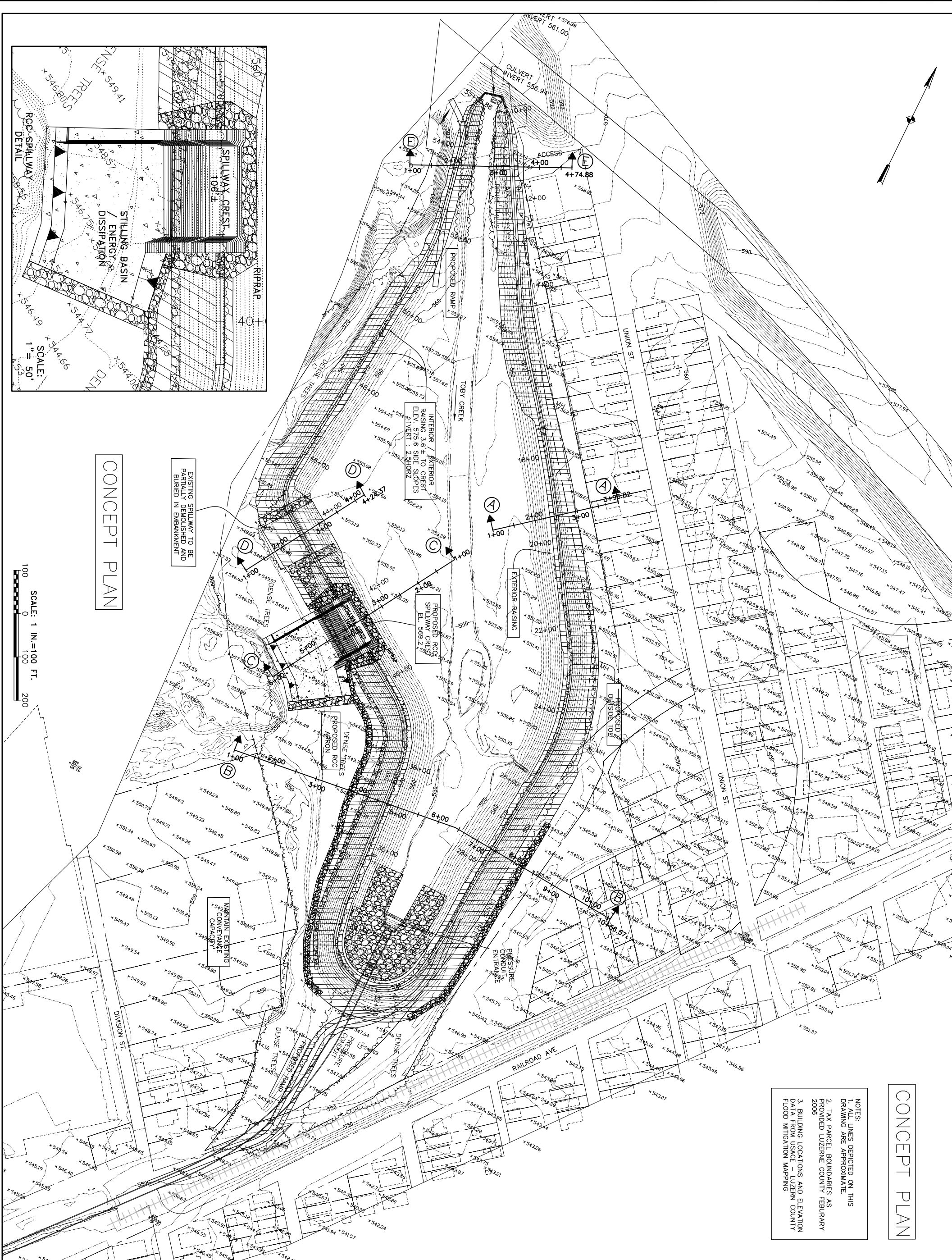
PENNSYLVANIA

SCALE: AS SHOWN

BALTIMORE DISTRICT OFFICE

BALTIMORE, MARYLAND





CONCEPT PLAN

EXISTING SPILLWAY TO BE PARTIALLY DEMOLISHED AND BURIED IN EMBANKMENT

INTERIOR / EXTERIOR RAISING 3.6' ± TO CREST ELEV. 575.6 SIDE SLOPES INVERT : 2 SHORZ

PROPOSED RAMP

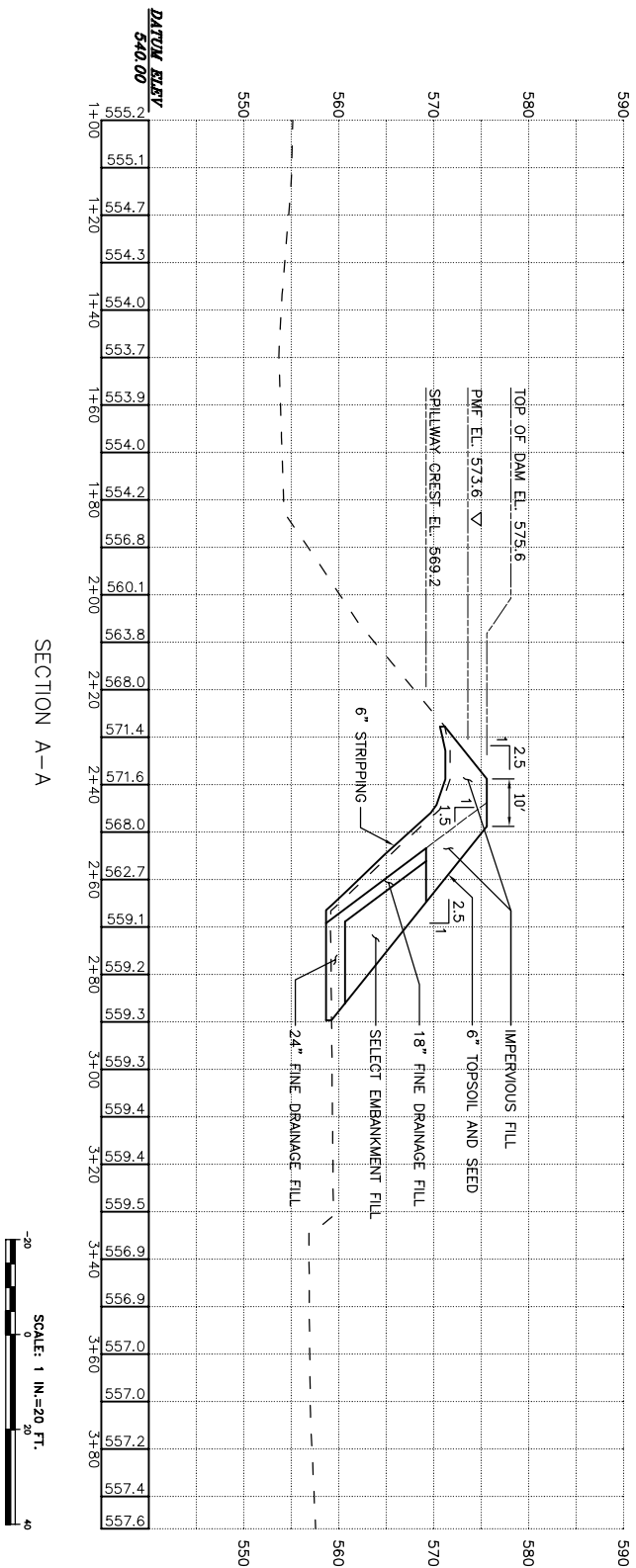
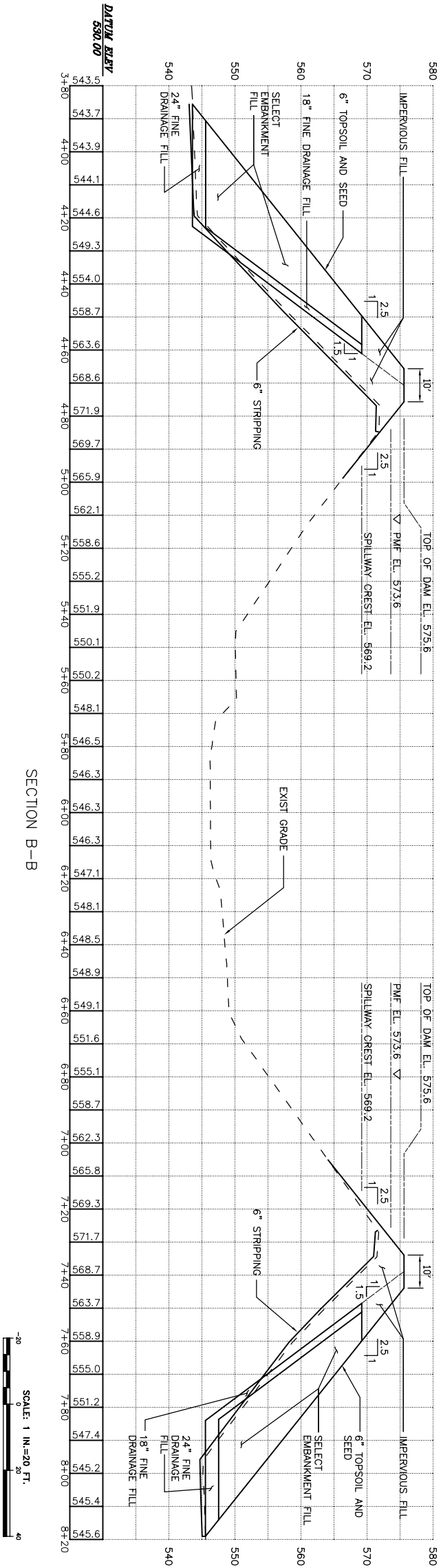
PROPOSED ORISIDE TIE

PROPOSED PRESSURE CONDUIT ENTRANCE

- NOTES:
1. ALL LINES DEPICTED ON THIS DRAWING ARE APPROXIMATE.
 2. TAX PARCEL BOUNDARIES AS PROVIDED LUZERNE COUNTY FEBRUARY 2006
 3. BUILDING LOCATIONS AND ELEVATION DATA FROM USAGE - LUZERNE COUNTY FLOOD MITIGATION MAPPING

CONCEPT PLAN

A B C D E F G H

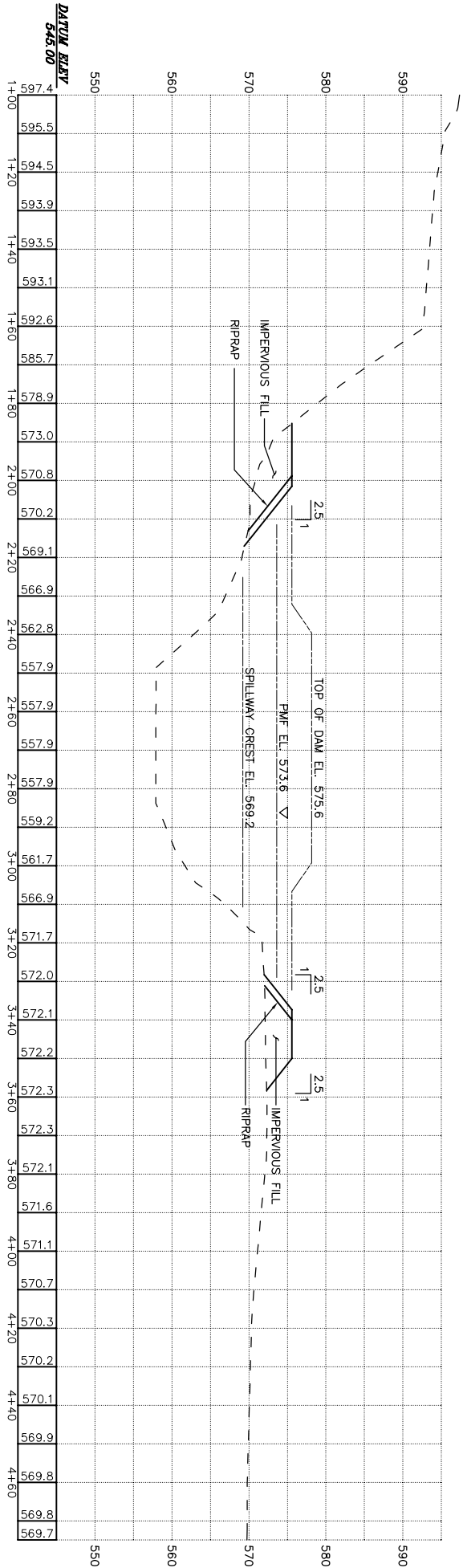


BY	DESCRIPTION	DATE	REV.	SYMBOL

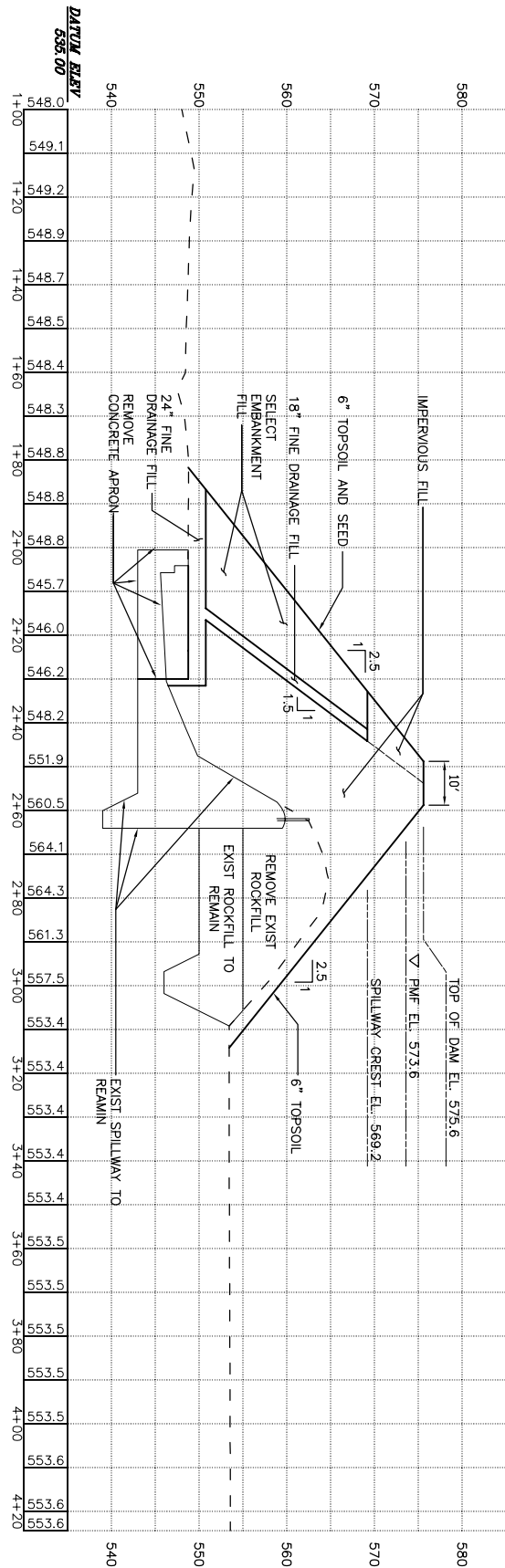
U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND			
PLATE	DRAWING NUMBER	FILE NAME XXXX-301XXX	
SCALE: AS SHOWN	DATE:	PLT SCALE:	1=1

SUSQUEHANNA RIVER FLOOD CONTROL PROJECTS
WYOMING VALLEY, PENNSYLVANIA
TOBY CREEK IMPOUNDING BASIN
LETTER REPORT CONCEPT PLANS
SECTIONS - RAISING AND
MODIFICATIONS 1 OF 2

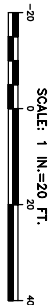
Sheet
Number:
3



SECTION E-E



SECTION D-D

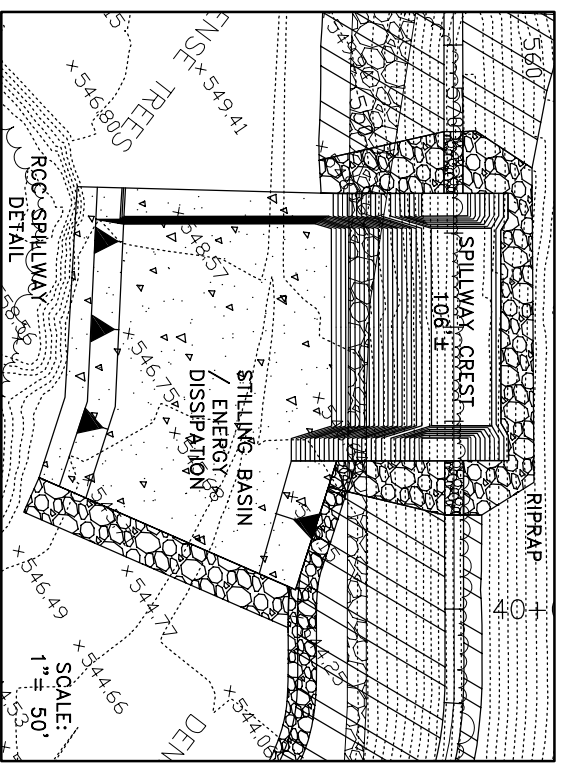
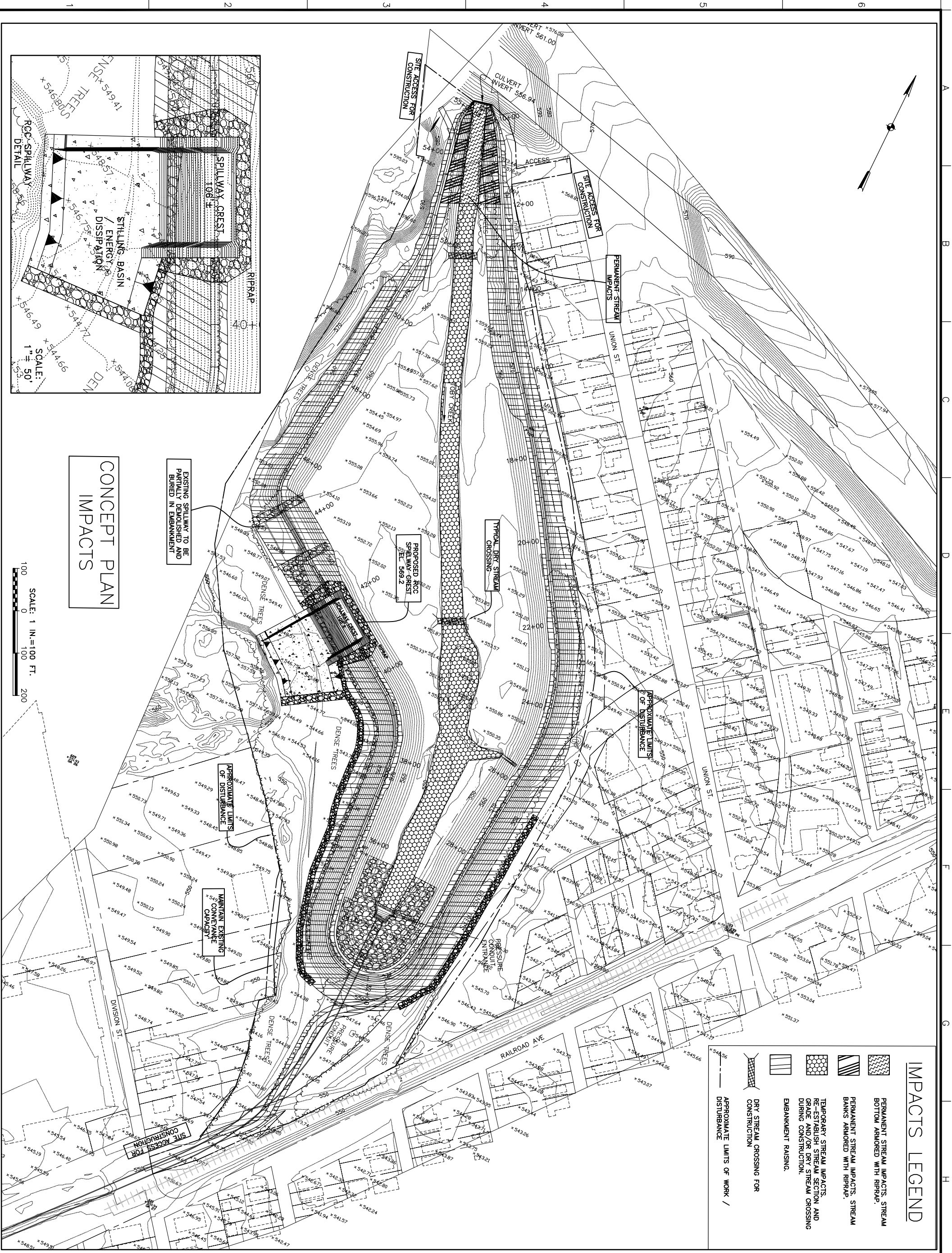


SYMBOL	REV.	DATE	DESCRIPTION	BY

U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND			
PLATE	DRAWING NUMBER	FILE NAME XXXX-303XXX	
SCALE: AS SHOWN	DATE:	PLT SCALE:	1=1

SUSQUEHANNA RIVER FLOOD CONTROL PROJECTS WYOMING VALLEY, PENNSYLVANIA TOBY CREEK IMPOUNDING BASIN LETTER REPORT CONCEPT PLANS SECTIONS - RAISING AND MODIFICATIONS 2 OF 2
--

Sheet Number: 4



CONCEPT PLAN
IMPACTS

SCALE: 1 IN. = 100 FT.
100 0 100 200

IMPACTS LEGEND

- PERMANENT STREAM IMPACTS, STREAM BOTTOM ARMORED WITH RIPRAP.
- PERMANENT STREAM IMPACTS, STREAM BANKS ARMORED WITH RIPRAP.
- TEMPORARY STREAM IMPACTS, RE-ESTABLISH STREAM SECTION AND GRADE AND/OR DRY STREAM CROSSING DURING CONSTRUCTION.
- EMBANKMENT RAISING.
- DRY STREAM CROSSING FOR CONSTRUCTION
- APPROXIMATE LIMITS OF WORK / DISTURBANCE

SUSQUEHANNA RIVER FLOOD CONTROL PROJECTS
WYOMING VALLEY, PENNSYLVANIA
TOBY CREEK IMPOUNDING BASIN
LETTER REPORT CONCEPT PLANS
**TOBY CREEK IMPOUNDING BASIN
CONCEPT PLAN IMPACTS**

U.S. ARMY ENGINEER DISTRICT, BALTIMORE
CORPS OF ENGINEERS
BALTIMORE, MARYLAND

PLATE	DRAWING NUMBER	FILE NAME
		Proposed TCIB
SCALE: AS SHOWN	DATE:	PLT SCALE: XXX

SYMBOL	REV.	DATE	DESCRIPTION	BY

US Army Corps of Engineers
Baltimore District

Remedial Seepage Repairs – Plans and Sections

Remedial Seepage Repairs Wyoming Valley Levee Raising Project, PA

Since the completion of raising the levees, there have been several high river events. During these events, excess seepage and small sand boils have been observed along various reaches of the project. Provided in this appendix are proposed remedial seepage control measures for these reaches. Below is a description of the problems and the recommended remedial investigation and repairs.

- Kingston/Edwardsville downstream of Church Pump Station: Seepage and small sand boil beyond toe of the berm. Install trench drain and collector pipe for relief wells.
- Swoyersville/Forty Fort adjacent to airport runway in vicinity of Station 220+00. Seepage and small sand boil beyond toe of berm. Install small seepage berm and/or possibility some relief wells.
- Swoyersville/Forty Fort existing seepage berm. Investigate blockage of berm toe and drain. If blocked install finger drains
- Kingston/Edwardsville, Kirby Park: Investigation of wet spot on slope.
- Plymouth, near Flat Street ramp: Investigation of wet spot and seepage at toe of levee. Install a small toe drain to collect seepage.
- Wilkes-Barre/Hanover, vicinity of water tunnel: Seepage along toe. Install small berm and/or relief wells.
- Wilkes-Barre/Hanover, downstream of Delaney Street Pump Station. During the June 2006 flood event, a sinkhole developed landward of the levee toe, which was caused by the failure of the 30" corrugated metal pipe (CMP) that collects the flow from the relief wells downstream of the Delaney Street Pump Station. The failure of the pipe allowed large amounts of foundation materials to flow into the pipe, creating large voids around and beneath the pipe, which caused additional damaged to the 30" diameter pipe. Several options were evaluated. The most cost effective option would be to install several new relief wells at the toe of the levee berm and abandoned the damaged collector pipe and existing relief well system.

In order to develop a cost for each of these remedial seepage repairs, a concept fix was selected and appropriate cost estimate developed for each location/fix.

Remedial Seepage Repairs:

Location: Kingston/Edwardsville, Pa
Downstream of Church St. Pump Station (Station 316+00)

During the last several high river events, small sand boils have been observed along the landside levee toe downstream of the Church St. pumping station between Stations 315+00 and 319+00. This area has had a history of underseepage problems. In 1984, a seepage berm and additional relief wells were installed along this reach to control underseepage. However, even with these measures, significant seepage pressures still appear to develop landward berm. The 1984 relief well screens were installed in the aquifer located approximate from 15 to 35 feet below the ground surface. It appears that either the seepage is by passing the wells or some of the seepage is flowing through the top blanket consisting of sands and silts. One possible option to control underseepage and the uplift pressures would be to install some additional relief wells and to install a seepage trench along the toe of the berm to collect seepage through the blanket. Another option would be to lower the discharge elevation of the existing relief wells by placing a collector pipe below the ground surface and connecting the pipe to the pump station intake chamber. For this report, it was conservatively assumed that all the alternatives, described above, would be necessary. On the following pages are the proposed quantities for the repair.

Repairs:

- Install new Toe Trench Drain (with collector pipe & manholes)
- Modify 11 Existing Relief Wells to tie into new collector pipe below the ground surface.
- Install 5 new Relief Wells (also connected to collector pipe).

2	P.O.L. #2 R3
P.L.	STA. 7+64.66
COORD.	N. 403.594.62
	E. 2.514.686.29

RAMP STA. B+25.30
= LEVEE STA. 324+00

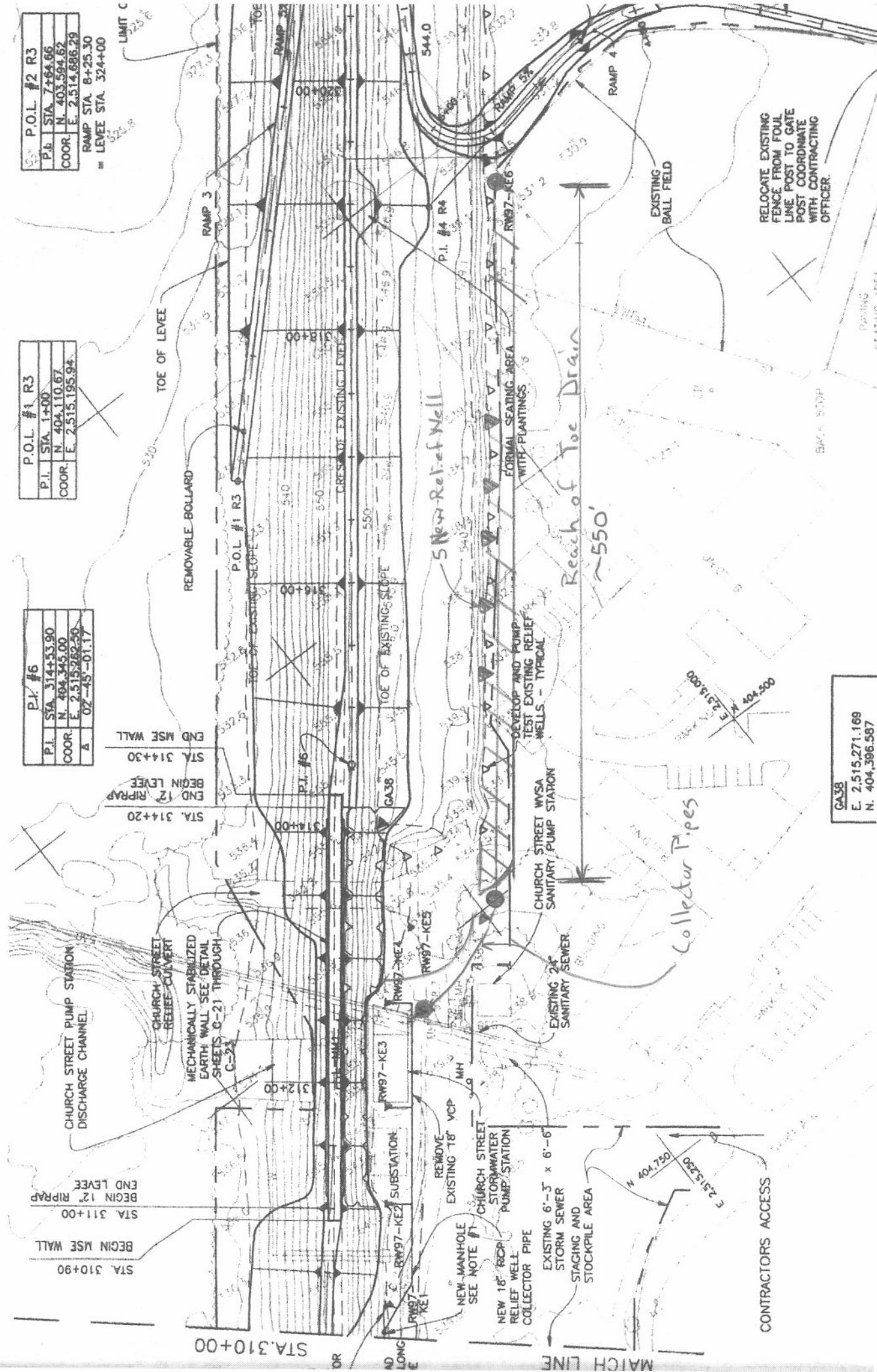
P.O.L. #1 R3	
P.I.	STA. 1+00
COORD.	N. 404.110.67 E. 2,515.195.94

P.I. #6	
P.I.	STA 314+53.90
COORD.	N. 404.345.00
	E. 2.515.262.50
Δ	02'-45"-01.17

REMOVE ALL TREES WITHIN 20' OF RIVERSIDE TOE OF NEW LEVEE UNLESS OTHERWISE DIRECTED. COORDINATE WITH THE CONTRACTING OFFICER.

RELOCATE EXISTING
FENCE FROM FOUL
LINE POST TO GATE
POST COORDINATE
WITH CONTRACTING
OFFICER.

GA38
E. 2,515,271.169
N. 404,396.587



5

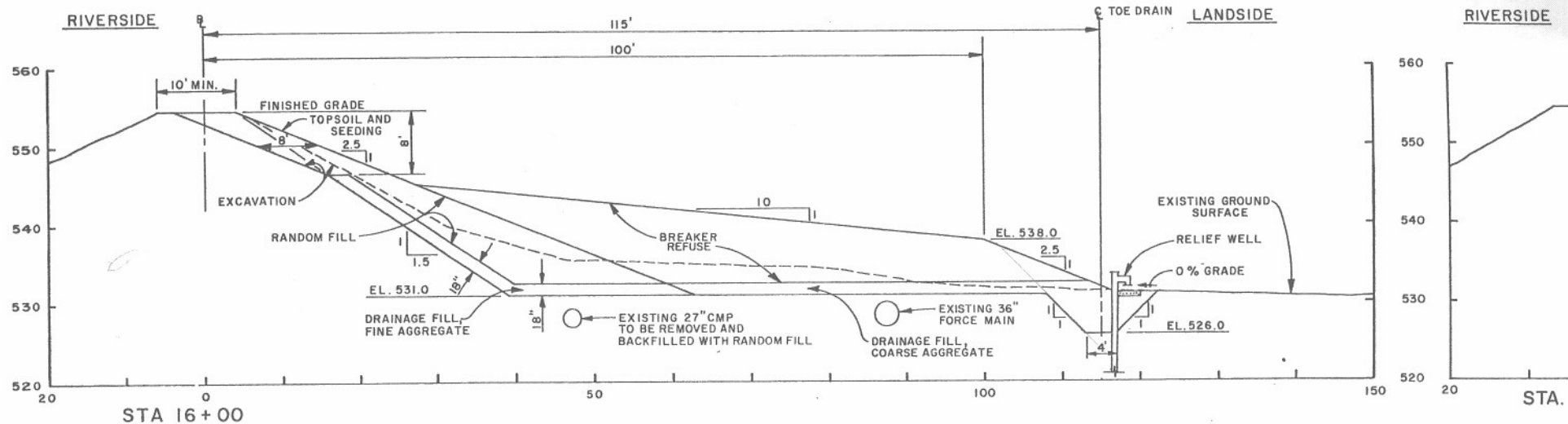
4

3

RIVERSIDE

LANDSIDE

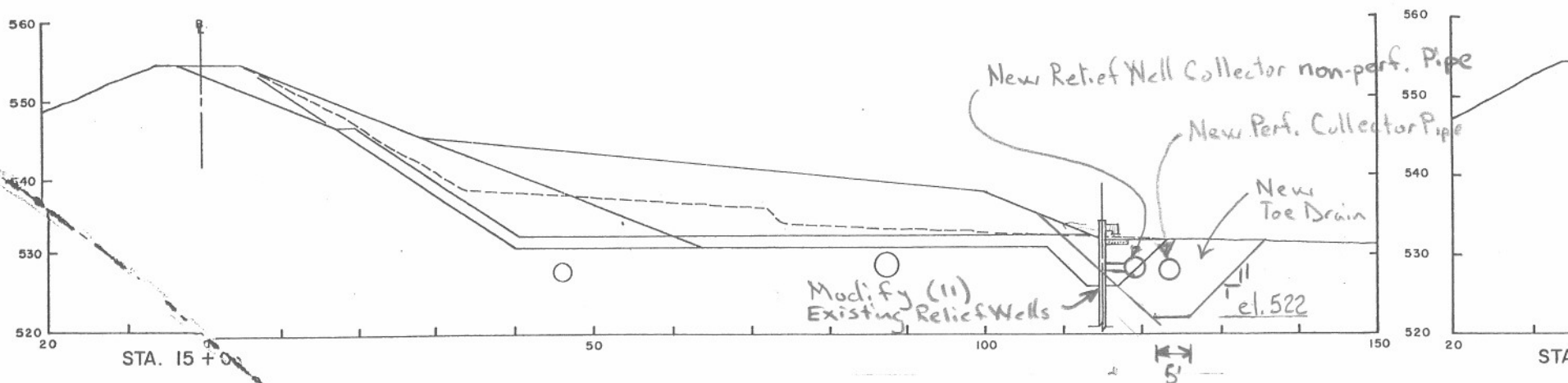
RIVERSIDE



STA 16+00

STA.

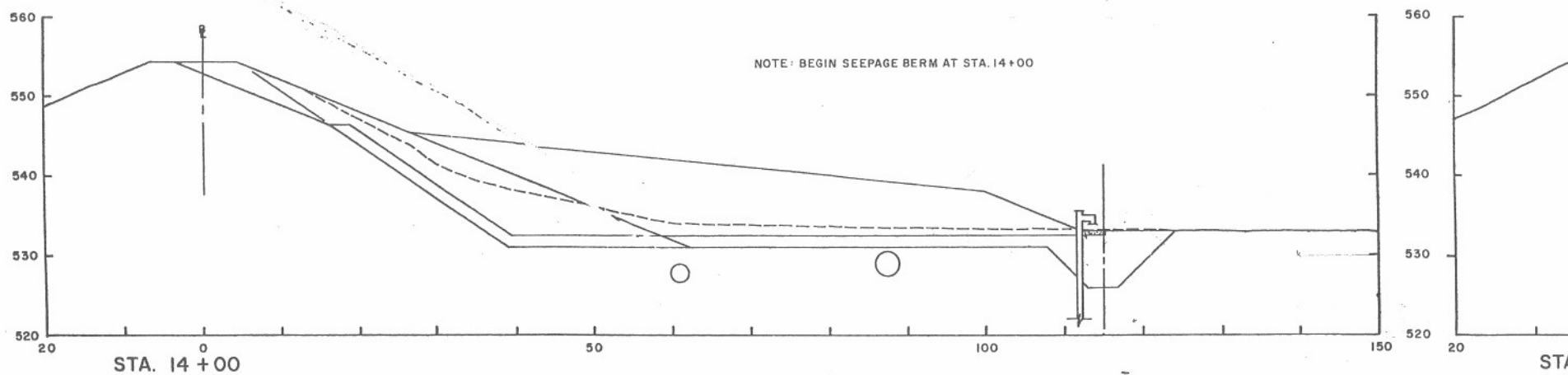
ELEVATIONS ARE IN FEET ABOVE NGVD



STA. 15+00

STA

NOTE: BEGIN SEEPAGE BERM AT STA. 14+00



STA. 14+00

STA

New Relief Well Collector non-perf. Pipe

New Perf. Collector Pipe

New Toe Drain

Modify (11) Existing Relief Wells

el. 522

5'

Remedial Seepage Repairs:

Location: Swoyersville/Forty Fort, Pa
 In Vicinity of Airport Runway (Station 220+00)

Snyersville/Fort Fort Remedial Seepage Repair - Quantities (Airport Runway)

12/06

During the last several high river events, small sand boils have been observed along the landside levee toe in the vicinity of the airport runway at Station 220+00. One possible option to control this underseepage and high uplift pressures would be to install a seepage berm. Based on design of the berm just upstream of this area, the berm proposed for this reach between Station 215+00 and 225+00 would be approximately 50 feet wide and 5.5 feet thick. It would have a fine drainage fill layer (18" thick) placed on the existing subgrade and 4-foot thick zone of breaker refuse material placed above the drainage layer. Below are the proposed quantities for the berm.

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



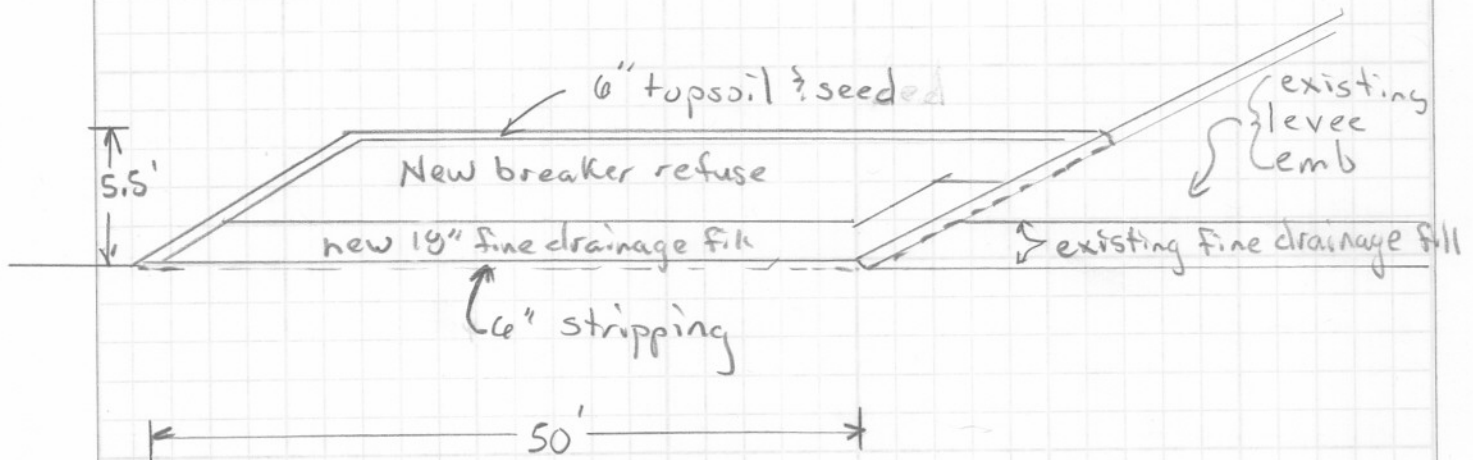
$$\text{Stripping} = 50 (1000) (.5) \frac{1}{27} = 53704 \text{ cy}$$

$$\text{fine drainage fill} : (1.5)(1000)(50) \frac{1}{27} = 2778 \text{ cy}$$

$$\text{breaker refuse mat'l} : (4)(1000)(50) \frac{1}{27} = 7407 \text{ cy}$$

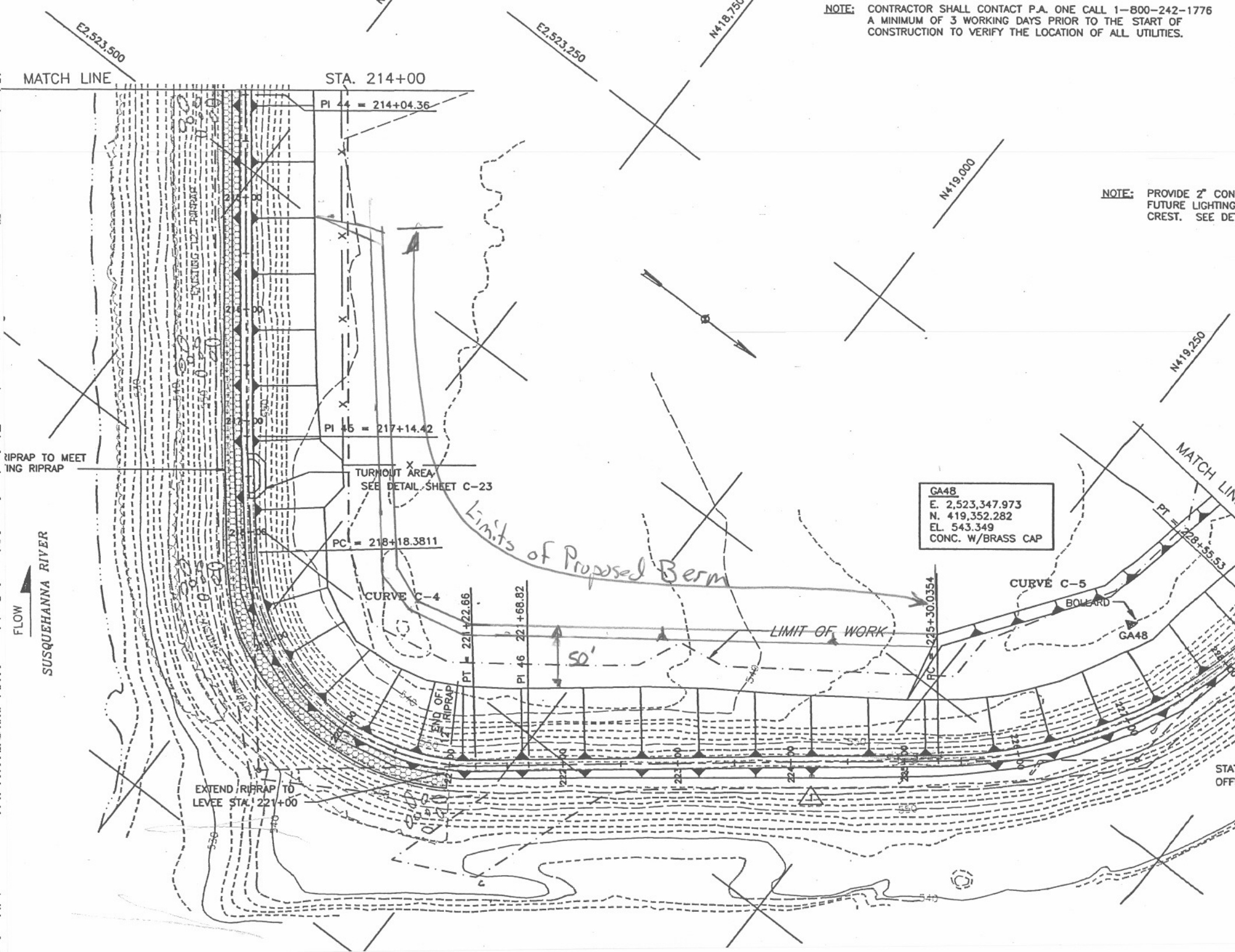
$$\text{Reuse mat'l from stripping for topsoil} : 3704 \text{ cy}$$

$$\text{Seed area} : (60)(1000) \frac{1}{9} = 6,667 \text{ sy}$$



NOTE: CONTRACTOR SHALL CONTACT P.A. ONE CALL 1-800-242-1776
A MINIMUM OF 3 WORKING DAYS PRIOR TO THE START OF
CONSTRUCTION TO VERIFY THE LOCATION OF ALL UTILITIES.

NOTE: PROVIDE 2" CON
FUTURE LIGHTING
CREST. SEE DE



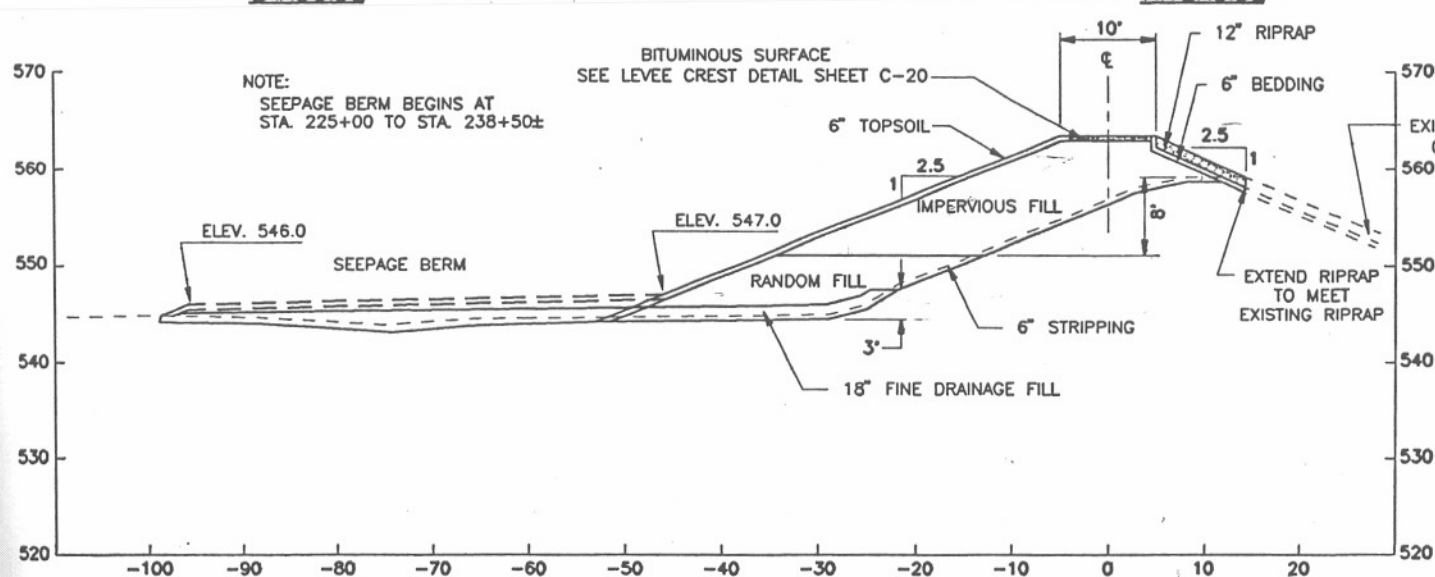
5

4

3

LANDSIDE

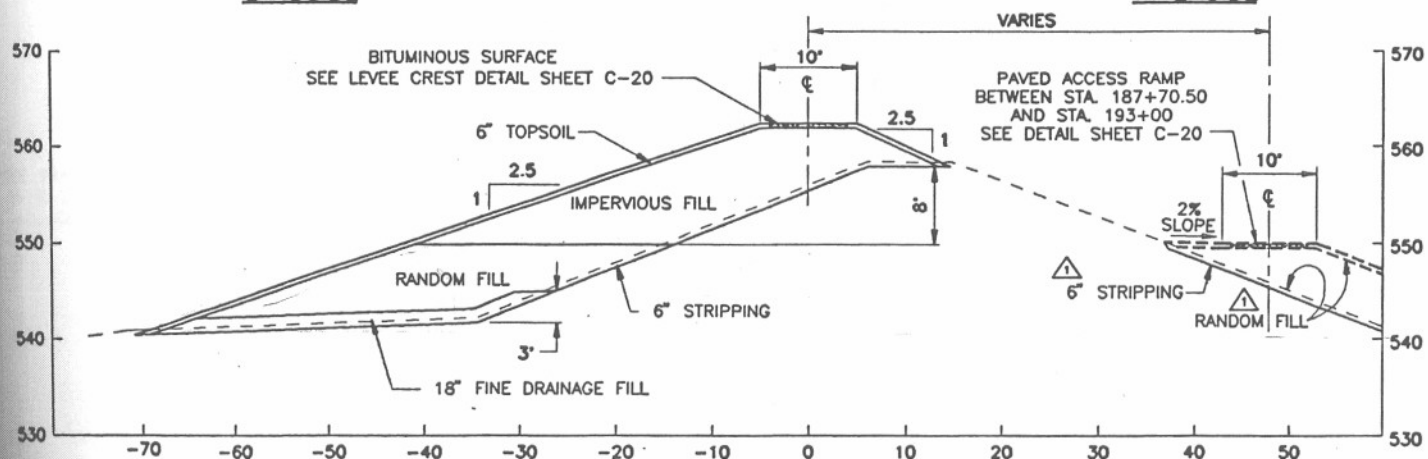
RIVERSIDE



TYPICAL SECTION FROM STA 200+00 TO 226+00

LANDSIDE

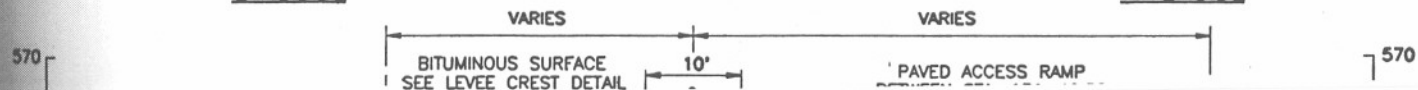
RIVERSIDE



TYPICAL SECTION FROM STA 168+00 TO 200+00

LANDSIDE

RIVERSIDE

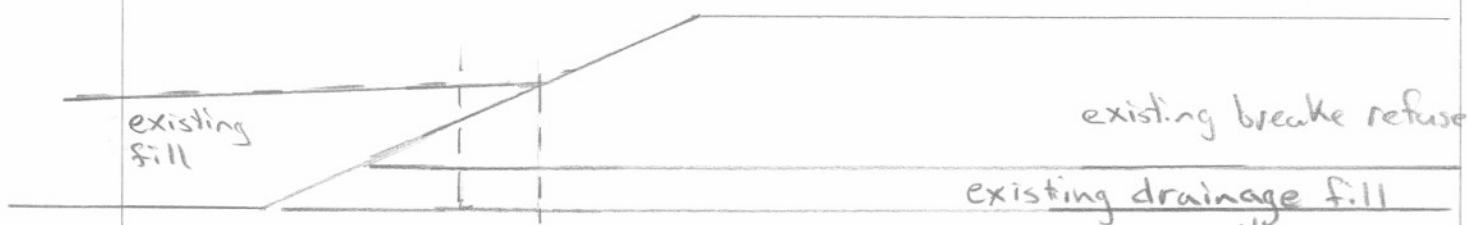


Remedial Seepage Repairs:

Location: Swoyersville/Forty Fort, Pa
In Vicinity of Ball Field (Station 130+00 - 160+00)

Between Station 130+00 and 168+00, there is an existing seepage berm constructed of breaker refuse material placed on top of a fine drainage fill layer. This berm, which was constructed in 1977, controls underseepage pressures. Since the construction of this berm, several ball fields were installed along the toe of the berm using fill to provide final graded surface for the fields. It appears that along certain reaches of the berm toe, the fill placed for the ball fields has been placed against the toe of the seepage berms, which may prevent unrestricted flow or seepage from the berm. It is proposed that several test pits be excavated along the toe of the berm to determine the actual toe of the berm. If it is found that reaches of the berm face are blocked, it is recommended that figure drains or continuous small trench drains be installed along the toe of the berm in order to collect seepage and discharge it slightly beyond the berm toe. Below are the proposed quantities for the figure drains and continuous trench drains along certain reaches of the berm.

Assume installing two 500-foot long trench drains along toe of berms.



Assume: 3' deep x 2' wide
Backfill with #57 stone
and lined with geotextile
6" dia Perforated plastic pipe.

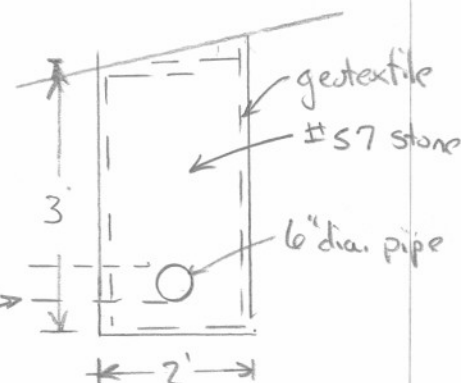
$$\text{Excavation: } 2[(500)(2)(3)]/27 = 112 \text{ cy}$$

$$\text{Backfill \#57 stone} = 112 \text{ cy}$$

$$\text{Geotextile } 2[500(3+3+2+2+1)]/9 = 1222 \text{ sy}$$

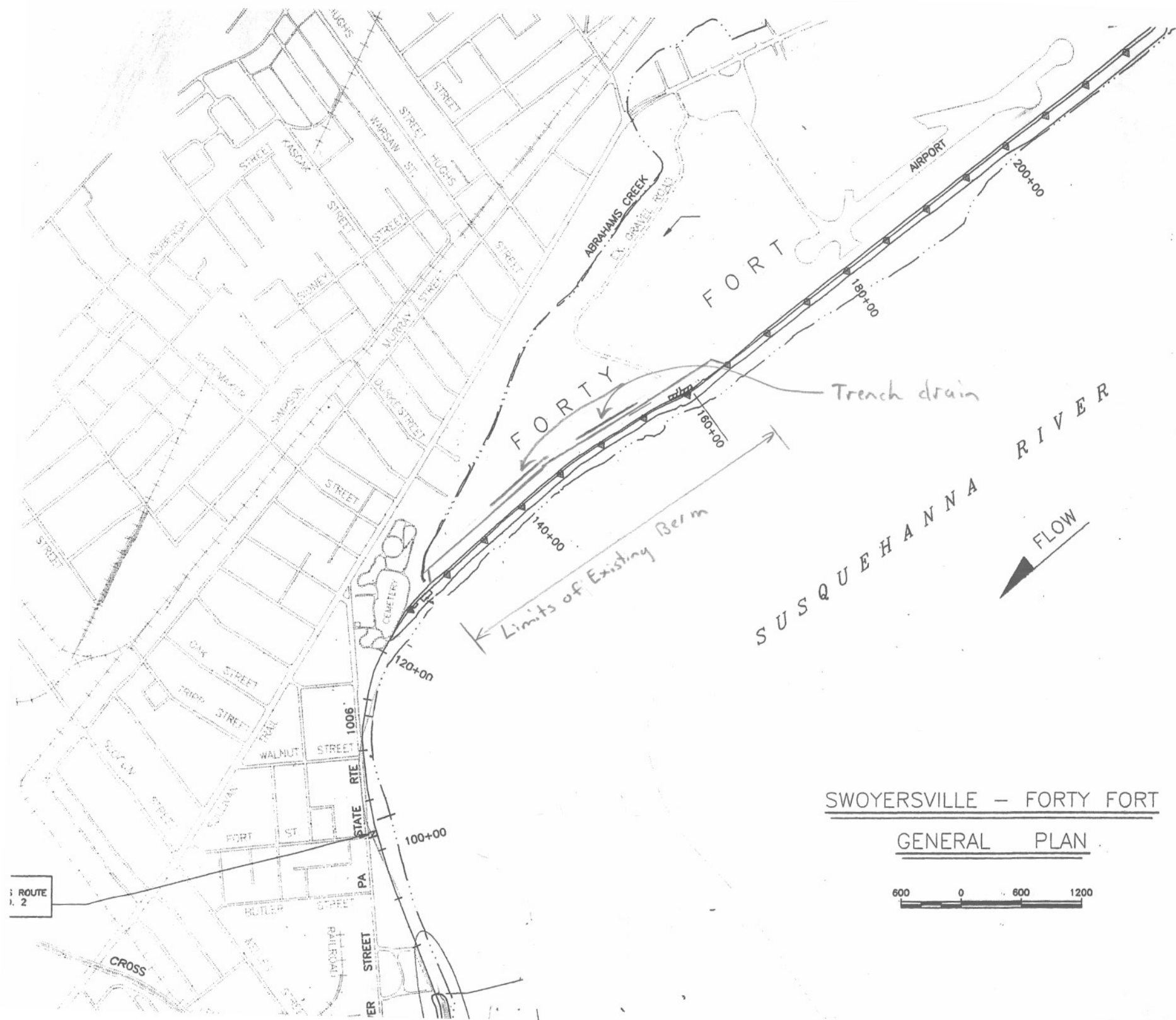
$$6" \text{ perforated plastic pipe } 2[500+3(20)] = 1120 \text{ lf}$$

discharge pipes



NOTES:

- EXISTING MC
TOP AND RE
- SEE SEDIME
SEDIMENT O



SWOYERSVILLE — FORTY FORT
GENERAL PLAN



Remedial Seepage Repairs:

Location: Hanover Twp, Pa
 In Vicinity of Water Tunnel (Station 229+00)

During the last several high river events, areas along the landside levee toe in the vicinity of the water tunnel (Station 229+00) were noted as being soft and spongy. In addition, water ponds at the levee toe making it difficult to inspect. One possible option to control this underseepage and provide access to the area for inspection would be to install a small seepage berm. The berm proposed for this reach between Station 224+00 and 229+00 would be approximately 25 feet wide and 4.5 feet thick. It would have a fine drainage fill layer (18" thick) placed on the existing subgrade and 3-foot thick zone of breaker refuse material placed above the drainage layer. Below are the proposed quantities for the berm.

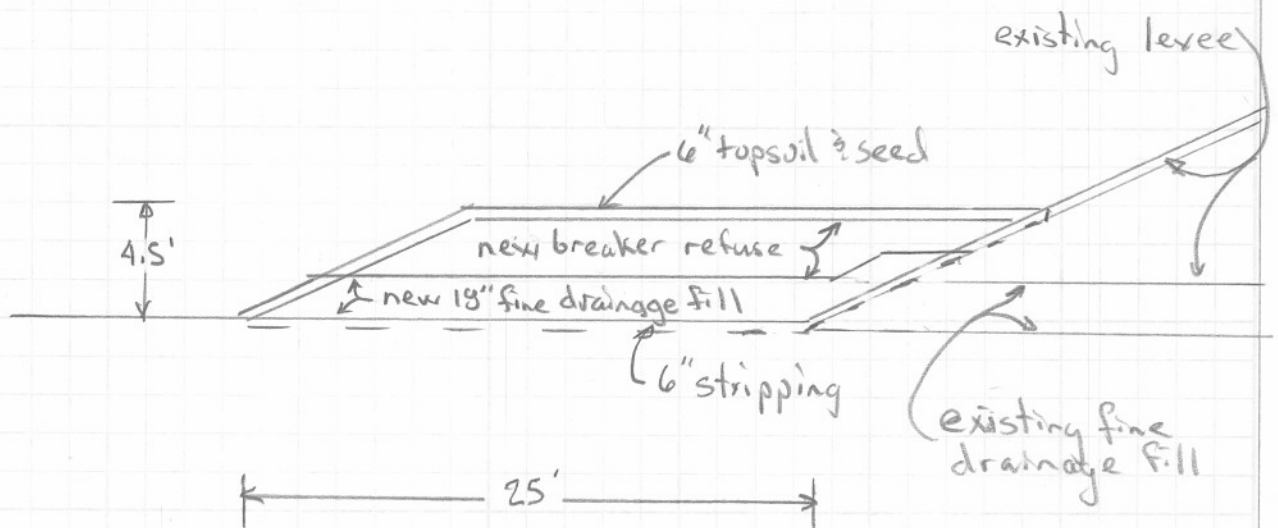
$$\text{Stripping: } (20)(500)(.5) \frac{1}{27} = 186 \text{ cy}$$

$$\text{fine drainage fill: } (20)(500)(1.5) \frac{1}{27} = 556 \text{ cy}$$

$$\text{breaker refuse mat'l: } (20)(500)(3) \frac{1}{27} = 1111 \text{ cy}$$

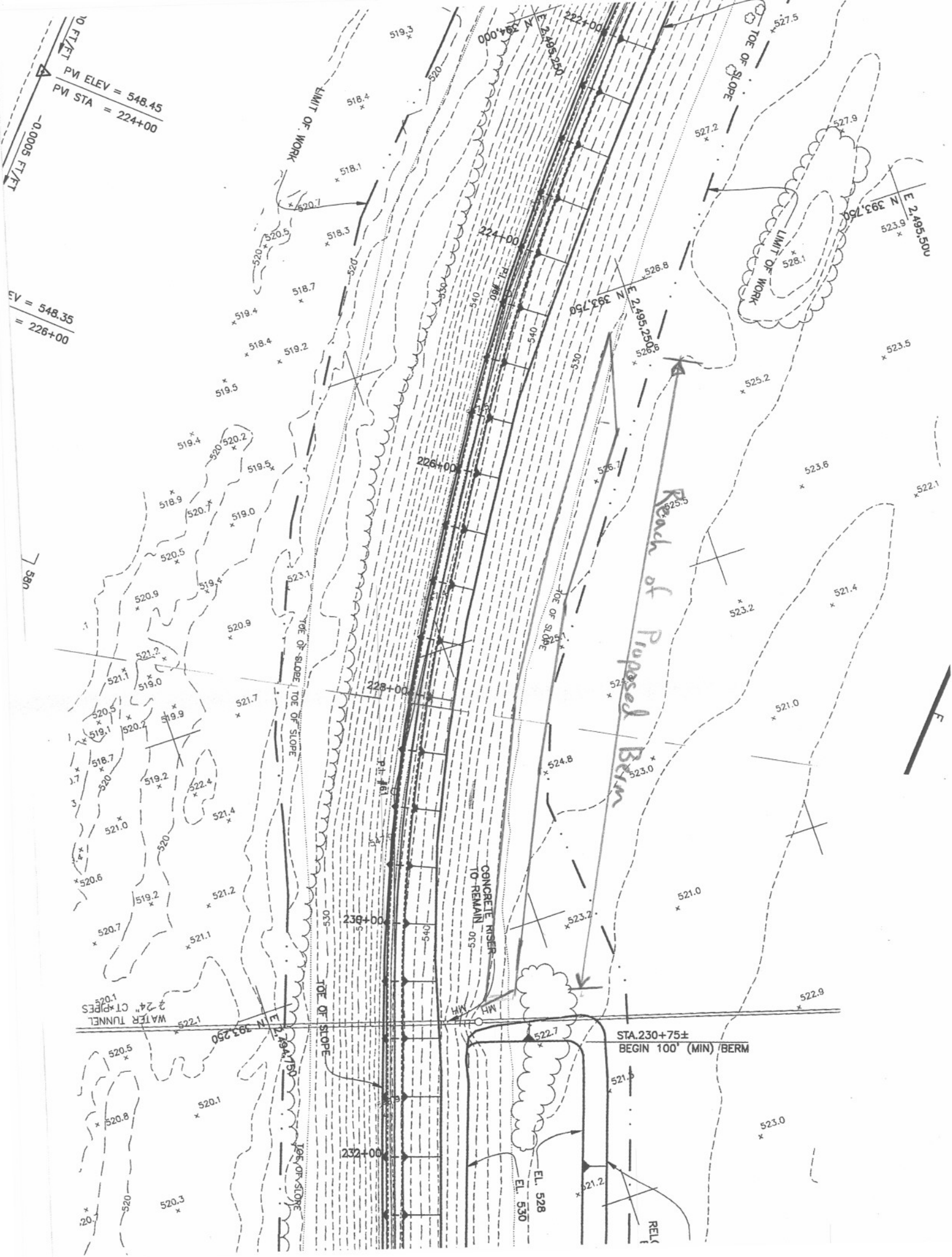
$$\text{Reuse mat'l from stripping for topsoil} = 186 \text{ cy}$$

$$\text{Seed area } (25)(500) \frac{1}{9} = 1,389 \text{ sy}$$



10 FT/FT
PM ELEV = 548.45
PM STA = 224+00
-0.0005 FT/FT

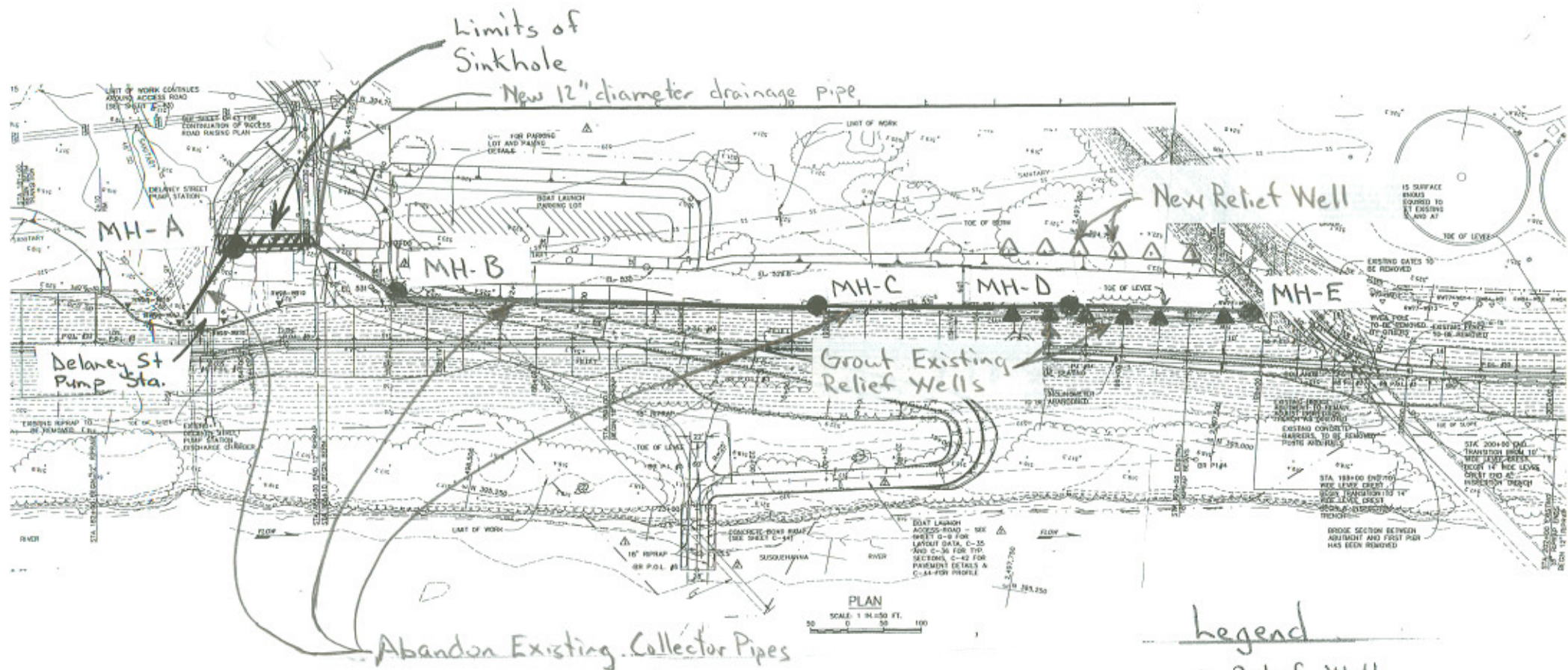
EV = 548.35
= 226+00



Remedial Seepage Repairs:

Location: Hanover Twp, Pa
Downstream of Delaney Street Pump Station
Repairs to Relief Well Collector System

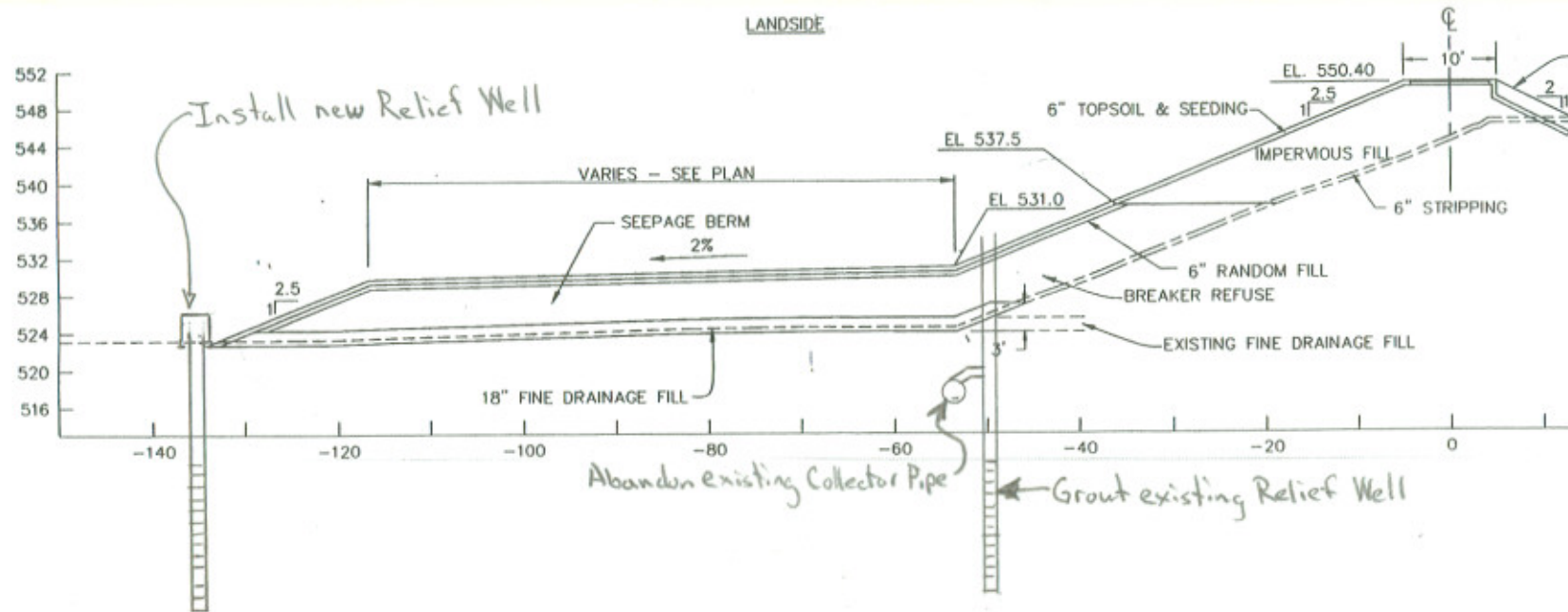
During the June 2006 flood event, a sinkhole developed landward of the levee toe, which was caused by the failure of the 30" corrugated metal pipe (CMP) that collects the flow from the relief wells downstream of the Delaney Street Pump Station. The failure of the pipe allowed large amounts of foundation materials to flow into the pipe, creating large voids around and beneath the pipe, which caused additional damaged to the 30" diameter pipe. Several options were evaluated. The most cost effective option would be to install several new relief wells at the toe of the levee berm and abandoned the damaged collector pipe and existing relief well system.



- Legend
- ▲ Relief Well
 - Manhole
 - Collector Pipe
 - ▨ Sinkhole
 - △ New Relief Well

Option 4

Plan of Relief Well System & Sinkhole
Delaney St. Pump Station



Delaney Street Pump Station – Repairs to Relief Well Collector System – Option 4

Option 4 would consist of installing six (6) new 8-inch diameter relief wells at the toe of the seepage berm. The existing 6 relief well would be completely abandoned by filling the entire screen and riser with a grout mix. Also, the entire existing collector pipe would be abandoned by using a grout mix or flowable fill to plug the pipe.

Below is list of the materials & quantities

- 1.) Install 6 new relief wells (see next sheet for quantities)
- 2.) Abandon (grout) 6 existing relief wells. (see next sheet for quantities)
- 3.) Grout existing 30" and 24" diameter collector pipe for the entire system
Approx. 1300 linear feet of pipe or ~ 220cy of either a grout mix or flowable fill
can be used to plug the pipes. (see option 3 for quantity calcs.)
- 4.) Install new 12" diameter PE drainage pipe for inlet at Maintenance Building (see Option 1 for quantities)

Wyoming Valley

Quantities

App. 11

ATTACHMENT B



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

REPLY TO
ATTENTION OF

0 8 NOV 2000

MEMORANDUM FOR DEPUTY COMMANDER FOR CIVIL WORKS

SUBJECT: Wyoming Valley Project, Pennsylvania

On November 1, 2000, Dr. Westphal and I met with Congressman Paul Kanjorski to discuss his proposals for modifying the Wyoming Valley project. As a result of that meeting, on November 2, I met with your staff to evaluate potential administrative options and legislative requirements for implementing the provisions included in Section 354 (copy enclosed) of the House version of the Water Resources Development Act of 2000. A representative of the Baltimore District participated via the telephone.

Enclosed for information and appropriate action is a copy of a letter that Dr. Westphal recently sent to Congressman Kanjorski outlining the actions the Army Corps of Engineers will take to address project needs. The actions outlined in the letter represent agreements reached with your staff on these issues. We thank you for the very quick and thoughtful assistance provided by Corps Headquarters.

A handwritten signature in cursive script, reading "Michael L. Davis", is positioned above the printed name.

Michael L. Davis
Deputy Assistant Secretary
(Policy and Legislation)

Enclosures



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

08 NOV 2000

REPLY TO
ATTENTION OF

Congressman Paul Kanjorski
United States House of
Representatives
Washington, D.C. 20515-3811

Dear Congressman Kanjorski:

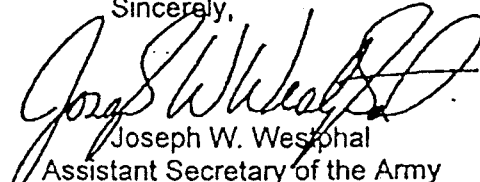
I am writing this letter to follow-up on our November 1, 2000, meeting concerning legislation that you have proposed for the Wyoming Valley, Pennsylvania project. Specifically, you asked my office to evaluate potential administrative options for implementing the provisions included in Section 354 (copy enclosed) of the House version of the Water Resources Development Act of 2000. As you know, Section 354 was not included in the final Conference Report that passed the House on November 3, 2000.

We have reviewed Section 354 and discussed these provisions with the Army Corps of Engineers Headquarters and the Baltimore District staff. We have determined that we have the authority to undertake several of the proposed provisions. In this regard, subject to a determination that such provisions are technically feasible, environmentally acceptable, and economically justified, we have asked the Corps to take steps to implement subsections (b)(2) concerning portal modifications, (b)(3) concerning a concrete capped sheet pile wall in lieu of raising an earthen embankment, and (b)(5) which requires an evaluation of existing projects.

In regard to the other provisions in Section 354, we have determined that the Corps does not have existing authority to implement such provisions. Based on our meeting I understand that you intend to pursue legislation to effect any provision of Section 354 that cannot be implemented under current authority. While I cannot take a position on such legislation at this time, I would recommend that you consider elimination of subsection (d). Based on our review, we believe that the prudent approach would be to incorporate questions concerning mitigation and the disposition of the Bloomsburg Railroad Bridge into the Corps ongoing Bloomsburg study. We expect this study to be completed in calendar year 2002.

It was a pleasure meeting with you last week and I trust that this letter is responsive to your request. As always, do not hesitate to contact me should you have any questions or comments.

Sincerely,


Joseph W. Westphal
Assistant Secretary of the Army
(Civil Works)

Enclosure

1 SEC. 354. WYOMING VALLEY, PENNSYLVANIA.

2 (a) IN GENERAL.—The project for flood control, Wy-
3 oming Valley, Pennsylvania, authorized by section 401(a)
4 of the Water Resources Development Act of 1986 (100
5 Stat. 4124) is modified as provided in this section.

6 (b) ADDITIONAL PROJECT ELEMENTS.—The Sec-
7 retary shall construct each of the following additional ele-
8 ments of the project to the extent that the Secretary deter-
9 mines that the element is technically feasible, environ-
10 mentally acceptable, and economically justified:

11 (1) The River Commons plan developed by the
12 non-Federal sponsor for both sides of the Susque-
13 hanna River beside historic downtown Wilkes-Barre.
14 * (2) Necessary portal modifications to the
15 project to allow at grade access from Wilkes-Barre
16 to the Susquehanna River to facilitate operation,
17 maintenance, replacement, repair, and rehabilitation
18 of the project and to restore access to the Susque-
19 hanna River for the public.

20 * (3) A concrete capped sheet pile wall in lieu of
21 raising an earthen embankment to reduce the dis-
22 turbance to the Historic River Commons area.

23 (4) All necessary modifications to the
24 Stormwater Pump Stations in Wyoming Valley.

25 * (5) All necessary evaluations and modifications
26 to all elements of the existing flood control projects



1 to include Coal Creek, Toby Creek, Abrahams Creek,
2 and various relief culverts and penetrations through
3 the levee.

4 (c) CREDIT.—The Secretary shall credit the Luzerne
5 County Flood Protection Authority toward the non-Fed-
6 eral share of the cost of the project for the value of the
7 Forty-Fort ponding basin area purchased after June 1,
8 1972, by Luzerne County, Pennsylvania, for an estimated
9 cost of \$500,000 under section 102(w) of the Water Re-
10 sources Development Act of 1992 (102 Stat. 508) to the
11 extent that the Secretary determines that the area pur-
12 chased is integral to the project.

13 (d) MODIFICATION OF MITIGATION PLAN AND
14 PROJECT COOPERATION AGREEMENT.—

15 (1) MODIFICATION OF MITIGATION PLAN.—The
16 Secretary shall provide for the deletion, from the
17 Mitigation Plan for the Wyoming Valley Levees, ap-
18 proved by the Secretary on February 15, 1996, the
19 proposal to remove the abandoned Bloomsburg Rail-
20 road Bridge.

21 (2) MODIFICATION OF PROJECT COOPERATION
22 AGREEMENT.—The Secretary shall modify the
23 project cooperation agreement, executed in October
24 1996, to reflect removal of the railroad bridge and



1 its \$1,800,000 total cost from the mitigation plan
2 under paragraph (1).

3 (e) MAXIMUM PROJECT COST.—The total cost of the
4 project, as modified by this section, shall not exceed the
5 amount authorized in section 401(a) of the Water Re-
6 sources Development Act of 1986 (100 Stat. 4124), with
7 increases authorized by section 902 of the Water Re-
8 sources Development Act of 1986 (100 Stat. 4183).

9 SEC. 355. REHOBOTH BEACH AND DEWEY BEACH, DELA-
10 WARE.

11 The project for storm damage reduction and shore-
12 line protection, Rehoboth Beach and Dewey Beach, Dela-
13 ware, authorized by section 101(b)(6) of the Water Re-
14 sources development Act of 1996, is modified to authorize
15 the project at a total cost of \$13,997,000, with an esti-
16 mated Federal cost of \$9,098,000 and an estimated non-
17 Federal cost of \$4,899,000, and an estimated average an-
18 nual cost of \$1,320,000 for periodic nourishment over the
19 50-year life of the project, with an estimated annual Fed-
20 eral cost of \$858,000 and an estimated annual non-Fed-
21 eral cost of \$462,000.



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1716
BALTIMORE, MD 21203-1716

REPLY TO
ATTENTION OF

CENAB-PP-C (1105)

27 November 2000

MEMORANDUM FOR Commander, North Atlantic Division, ATTN: CENAD-PP

SUBJECT: Wyoming Valley Levee Raising Project--Additional Feasibility Analysis

1. Reference letter, 8 November 2000, from ASA(CW) to Congressman Paul Kanjorski, copy enclosed.
2. ASA(CW) determined there is authority to undertake three project modifications, subject to a determination that they are technically feasible, environmentally acceptable, and economically justified.
3. The purpose of this memorandum is to provide an initial assessment of the viability of the proposed modifications and to present the process that will be used to reach final determination. The first two modifications, levee portals (item b2) and concrete capped sheet pile wall in lieu of embankment raising (item b3) are technically feasible and should not have significant adverse environmental impacts. The full project will remain economically justified with the inclusion of these two modifications.
4. The third modification calls for an evaluation of existing project features (item b5) which have not been previously studied as part of the levee raising design. Assessment of the viability of modifying these existing project features needs to be determined. The Corps of Engineers has completed little to no analysis on these project elements.
5. Detailed analyses of proposed modifications (b)(2) and (b)(3) will be made concurrent with the final design (plans and specifications) for the Wilkes-Barre Phase II portion of the levee raising project. The scope of the analysis will include technical feasibility, environmental acceptability through the NEPA process, and economic justification of the full project to include the proposed modifications. The levee portals and the sheetpile wall will be incorporated into the Wilkes-Barre Phase II design if our initial assessment is confirmed. The third modification, item (b)(5), would be implemented by separate design and construction contracts.
6. Based upon available information and current assumptions, the final analysis of proposed modifications (b)(2) and (b)(3) could be completed by the fall of 2001, and the final design for Wilkes-Barre Phase II could be completed in the winter of 2001/2002. The analysis for item (b)(5) is not set in scope or schedule as yet. It is thought that the scope and schedule could be developed by the fall of 2001. Funds are available to do the additional analysis and design work for FY01. Approval of the non-Federal sponsor for the additional work will be obtained through the SACCR process. The sponsor has been very involved in developing the proposals and we would expect quick approval.

ENCLOSURE

Received Time Dec. 13. 4:09PM
No. 3552
6/8 P

CENAB-PP-C

SUBJECT: Wyoming Valley Levee Raising Project--Additional Feasibility Analysis

7. Request your concurrence in the proposed course of action by 15 December 2000.
8. Questions regarding this matter should be directed to the Project Manager, Ms. Janet Harrington, at (215) 656-6696.

Encl

JAMES R. JONES
Chief, Programs and Project
Management Division

CF: CENAD-BT-P (Tosi)

HARRINGTON/vm/2156566696/CENAB-PP-C

EMP 27 Nov 2000
PALGUTA/CENAB-PP-C 0140h/s11/27/00
Se/S for ALINDNER/CENAB-PL
14 28 Nov 00

JOHNSON/CENAB-EN-M

806 11/20/00
GEMBICKI/CENAB-EN

sp for DAVIS/CENAB-OC 11/28/00

LEA/CENAB-PP

EMP 20 Nov 00 1430h/s
for JONES/CENAB-PP

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CENAD-PP-C (CECW-BE/27 Nov 00) (11-2-240g) 1st End
Mr. FINS/mdf/718-491-8713

SUBJECT: Wyoming Valley Levee Raising Project-Additional Feasibility Analysis

DA, Corps of Engineers, North Atlantic Division, Fort Hamilton Military
Community, 302 General Lee Avenue, Brooklyn, NY 11252 22 December 2000

FOR: Commander, Baltimore District, ATTN: CENAB PP-C

* CENAD concurs in the proposed course of action outlined in basic letter. A
revised cost benefit analysis and SACCR should be prepared as soon as
possible.

Lawrence C. Petrosino
for J. JOSEPH TYLER, P.E.
Director, Programs Management
Directorate



DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

21 DEC 2001

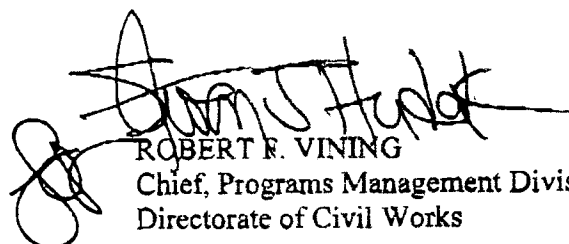
CECW-BE

MEMORANDUM FOR COMMANDER, North Atlantic Division
ATTN: CENAD-PM-C (Mr. Petrosino)

SUBJECT: Wyoming Valley Levee Raising Project - Additional Feasibility Analysis

- 1 Reference CENAD-PM-C memorandum dated 9 November 2001, subject above.
2. We concur with NAD's assessment that of items mentioned in paragraph 2 of CENAB-PP-C memorandum dated 9 November 2001, only the items discussed in paragraph 2a of the memorandum could be evaluated under the Wyoming Valley Levee Raising Project authority. In addition, projects considered for implementation under the Wyoming Valley Levee Raising Project authority must meet the conditions indicated in ASA(CW) letter to Congressman Kanjorski, dated 8 November 2000. Items discussed in paragraph 2b of the NAB memorandum do not fall within the authority of the Wyoming Valley Levee Raising Project and seem more appropriate for consideration by local interests.
3. The CENAB should advise Congressman Kanjorski that construction of parking facilities and hotel rehabilitations do not fall under the authority of the subject project and are not within the Chief's discretionary authority to study or implement as part of the levee raising project.

FOR THE COMMANDER:


ROBERT E. VINING
Chief, Programs Management Division
Directorate of Civil Works

CENAD-PM-C (CENAB-PP-C/09 Nov 01 (11-2-240g) 1st End
Mr. FINS/mdf/718-765-7059

SUBJECT: Wyoming Valley Levee Raising Project (WVLRP)-Additional
Feasibility Analysis

DA, Corps of Engineers, North Atlantic Division, Fort Hamilton
Military Community, 302 General Lee Avenue, Brooklyn, NY 11252
30 November 2001

FOR: Commander, USACE, Washington, DC 20314-1000, ATTN: CECW-BE

CENAD concurs in CENAB's assessment that they have the authority to complete a feasibility evaluation of items outlined in paragraph 2a of basic letter and to construct those items to the extent they are found to be feasible at the proper cost sharing and within policy authorization. The items outlined in paragraph 2b cannot be addressed since they are not within the current Wyoming Valley authorization. Please advise of concurrence with this view.

for Lawrence C. Petrosino
THOMAS W WATERS, P.E.
Director,
Civil Works and Management



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MARYLAND 21203-1715

REPLY TO
ATTENTION OF

NOV 09 2001

CENAB-PP-C

MEMORANDUM FOR Commander, North Atlantic Division, ATTN: CENAD-PP

SUBJECT: Wyoming Valley Levee Raising Project (WVLRP)--Additional Feasibility Analysis

References:

- a. Memorandum for Deputy Commander for Civil Works, author Deputy Assistant Secretary, 8 November 2000, subject: Wyoming Valley Project, Pennsylvania (enclosed).
- b. OASA(CW) meeting with the staff of Senators Specter and Santorum and Congressman Kanjorski and his staff held 20 July 2001 in Washington DC, subject: Riverfront Development for Wilkes-Barre, Pennsylvania. Additional participants included representatives from HQUSACE, CENAB, the WVLRP non-Federal sponsor, the American Heritage River Navigator, Sasaki Associates consultants, and the Mayor of Wilkes-Barre.
- c. Memorandum for the Record, CECW-BE, dated 26 June 2001 (3rd revision, 14 August 2001), subject: Wyoming Valley Levee Raising Project, Pennsylvania (enclosed).

2. The purpose of this memorandum is to confirm that CENAB has authority to evaluate the items discussed during referenced meeting 1b and to request concurrence with our proposed procedures to complete the evaluation. Background information about the meeting is provided below:

a. During the 20 July 2001 meeting, Congressman Kanjorski requested that CENAB evaluate the Sasaki Riverfront Development Plan for Wilkes-Barre, dated 20 December 2000, to determine if any of the proposed elements could be constructed as part of the cost-shared WVLRP. Also, during this meeting higher authority supported incorporating feasible elements of the Sasaki design into the flood control project since additional sensitivity towards aesthetics and public access is viewed as the way flood control projects ought to be currently designed.

b. During the 20 July 2001 meeting, Congressman Kanjorski also requested that CENAB investigate whether the WVLRP could include cost-shared construction of three additional riverfront development elements not specifically included in the Sasaki Plan: a parking facility across River Street from the Market Street Bridge and the levee project; rehabilitation of the Sterling Hotel; and development of the River Landing at the Irem Temple, also located across River Street from the levee project.

3. Reference 1a and 1c do not direct CENAB to evaluate the design elements discussed at the 20 July 2001 meeting. CENAB therefore requests that higher authority confirm that CENAB is to complete a feasibility evaluation of items 2a and 2b, and then construct those items to the extent they are found to be feasible.

CENAB-PP-C

SUBJECT: Wyoming Valley Levee Raising Project (WVLRP)--Additional Feasibility Analysis

4. Following confirmation that evaluation of design elements presented in paragraphs 2a and 2b should be completed, CENAB would document the engineering, economic, and environmental feasibility of these elements in a letter report decision document for higher authority, in a manner consistent with the directions in reference memorandums 1a and 1c. CENAB would fund this study effort through existing project construction general funds.

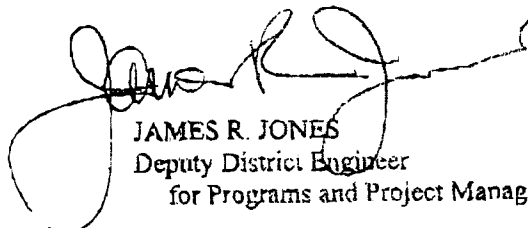
5. As discussed during referenced meeting 1b, the feasibility analysis will include the following efforts.

- a. Engineering Evaluation -- confirmation of which elements of the Sasaki plan are engineeringly feasible. Some elements of the Sasaki plan may require design modifications in order to adequately coexist with the flood control functions of the project, comply with the Americans with Disabilities Act of 1990, and minimize effects on the environment. Any design refinements to the Sasaki design will be described in the letter report.
- b. Economic evaluation -- CENAB will determine the demand and need for these additional elements and compare them to the costs of the elements to determine whether the items are economically feasible. CENAB cost engineers will confirm the accuracy of the conceptual level cost estimate from Sasaki Associates, and will make adjustments to reflect design refinements.
- c. Environmental evaluation -- CENAB will complete NEPA documentation to evaluate the environmental effects of the additional project elements.

6. CENAB will provide higher authority a schedule for submission of the draft letter report and draft NEPA compliance document upon confirmation of the district's authority and funding to proceed with this work. Should these additional design elements be found feasible, non-Federal sponsor approval to add these project elements to the WVLRP would be obtained. The Baltimore District would expect immediate approval by the sponsor.

7. Request your concurrence of the proposed course of action four (4) weeks after your receipt of this memorandum. Questions regarding this matter should be directed to the project manager, Ms. Janet Harrington, at 215-656-6696.

Encl


JAMES R. JONES
Deputy District Engineer
for Programs and Project Management

ATTACHMENT C

Compliance of the Proposed Action with Environmental Protection Statutes and Other Environmental Requirements

Federal Statutes	Level of Compliance ¹	Location in the Report
Archeological and Historic Preservation Act	Full	2.13 (pg.8)
Clean Air Act	Full	4.6 (pg.17)
Clean Water Act	Full	4.7 (pg. 17)
Coastal Barrier Resources Act	N/A	
Coastal Zone Management Act	N/A	
Comprehensive Environmental Response, Compensation and Liability Act	Full	2.14(pg 8)
Endangered Species Act	Full	4.11(pg. 19)
Estuary Protection Act	N/A	
Farmland Protection Policy Act	Full	2.4 (pg 5)
Federal Water Project Recreation Act	Full	4.2 (p 17)
Fish and Wildlife Coordination Act	Full	5.0 (pg. 23)
Land and Water Conservation Fund Act	N/A	
Magnuson-Stevens Act	N/A	
Marine Mammal Protection Act	N/A	
National Historic Preservation Act	Full	2.13 (pg.8)
National Environmental Policy Act	Full	5.0 (23)
Resource Conservation and Recovery Act	Full	2.14(pg. 8)
Rivers and Harbors Act	NA	
Water Resources Planning Act	Full	5.0 (pg 8)
Watershed Protection and Flood Prevention Act	Full	4.21(pg 23)
Wild and Scenic Rivers Act	N/A	2.12 (pg. 8)
Executive Orders, Memoranda, etc.		
Migratory Bird (E.O. 13186)	Full	
Protection and Enhancement of Environmental Quality (E.O. 11514)	Full	
Protection and Enhancement of Cultural Environment (E.O. 11593)	Full	
Floodplain Management (E.O. 11988)	Full	4.21(pg. 22)
Protection of Wetlands (E.O. 11990)	Full	2.8 (pg. 6)
Prime and Unique Farmlands (CEQ Memorandum, 11 Aug 80)	Full	2.4 (pg. 5)
Environmental Justice in Minority and Low-Income Populations (E.O. 12898)	Full	4.19 (pg. 22)
Protection of Children from Health Risks & Safety Risks (E. O. 13045)	Partial	4.20(pg. 22)

¹ Level of Compliance:

Full Compliance (Full): Having met all requirements of the statute, E.O., or other environmental requirements for the current stage of planning.

Non-Compliance (NC): Violation of a requirement of the statute, E.O., or other environmental requirement.

Not Applicable (N/A): No requirements for the statute, E.O., or other environmental requirement for the current stage of planning.

ATTACHMENT D

**CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION
TOBY CREEK IMPUNDMENT BASIN
WYOMING VALLEY FEDERAL FLOOD PROTECTION PROJECT
LUZERNE COUNTY, PENNSYLVANIA**

FEBRUARY 2007

I. PROJECT DESCRIPTION

a. Location - The Wyoming Valley Federal Flood Protection Project is located on the Susquehanna River in Luzerne County and consists of the four contiguous federal flood damage reduction projects originally completed in the 1940s at Plymouth, Kingston-Edwardsville, Swoyersville-Forty Fort, and Wilkes-Barre and Hanover Township, which together function as one large flood damage reduction system.

b. General Description - The levees extend for approximately 15 miles with 21 pump stations beside the levees--13 storm water pump stations and 8 sanitary pump stations. The four original Federal flood damage reduction projects in the Wyoming Valley were designed to protect against a flood equal to the March 1936 event which had a peak flow of 232,000 cubic feet per second. Completed modifications to the original project provide protection against flood flows of 318,500 cubic feet per second, which would be caused by a recurrence of Storm Agnes.

The proposed action for this 404(b)(1) evaluation consists of regarding and repairing the existing stream bed and slopes by removing material deposited in the stream and along the creek banks. Also, the creek bed and slopes will be repaired where rip-rap had been eroded and dislodged. Along certain reaches additional rip-rap will be installed for protection of the stream bank.

c. Purpose - The purpose of the proposed project is to maintain full flood protection of the existing Federal FPP. Repair of the project has been determined to be a benefit to the local community.

d. General Description of Discharge Material – Discharge material would be gravel, cobbles, and disturbed soil from the movement of machinery and repair of riprap protection. New Riprap stone will be placed on the bottom of approximately 300 linear feet of streambed. Riprap will also be placed along both sides of the creek banks and slopes for approximately 1,000 linear feet. Material will be placed by normal construction equipment such as an excavator.

e. Description of the Proposed Discharge Site – The proposed discharge site is located in the Toby Creek Impound Basin.

f. Description of Discharge Method – Repair involves bank work by using a front-end loader along the top of the bank. Heavy machinery may also work in the basin during the removal of debris. Excavation of materials could also involve use of a front-end loaders, backhoes and trackhoes.

g. Alternatives Considered – Alternative material removal and bank repair methods are currently being considered.

II. FACTUAL DETERMINATIONS

a. Physical Substrate Determinations

(1) *Substrate elevation and slope* - The substrate underlying the stone fill will be permanently compacted and capped by the stone. Within a few years this is expected to be covered by the normal bedload material.

(2) *Sediment Type* - Typical sediment types include silts, sands, gravel and cobble native to this part of Pennsylvania.

(3) *Dredged/Fill Material Movement* – There will be temporary adverse impacts such as increased erosion and soil excavation and compaction during construction activities at all the sites. No movement of fill materials is expected following project completion.

(4) *Other Effects* – If heavy machinery travels in the basin this will have a temporary adverse impact on the substrate. The substrate is expected to recover within 1-2 years following construction.

(5) *Actions Taken to Minimize Impacts* – Stabilization design alternatives were evaluated for minimizing encroachment into the basin without compromising the stability of the design. A sediment erosion and control plan will be prepared with best management practices implemented to minimize the suspension of sediment during construction activities. Of all the alternatives considered the riprap is the least impact to the basin.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) *Water*

(a) Salinity – Freshwater stream, no change expected.

(b) Chemistry - Minor and temporary mobilization of nutrients (nitrogen and phosphorus) due to working in the water.

(c) Clarity - A minor and temporary reduction in clarity is anticipated during construction due to turbidity created during placement of materials in and/or removal of sediments from the basin. No long-term impacts are expected. Clarity should return to normal within a week of construction completion.

(d) Color - A minor and temporary change in color is anticipated during construction due to turbidity created during placement of materials in and/or removal of sediments from the basin. No long-term impacts are expected. Turbidity and color changes should return to normal within a week of the completion of construction.

(e) Odor- No change expected.

- (f) Taste – No change expected.
- (g) Dissolved Gas Levels – Minor and temporary decrease in available oxygen may occur due to turbidity.
- (h) Nutrients - Possible temporary mobilization of nutrients (nitrogen and phosphorous) during construction of the project. No long-term change expected. Normal conditions will return after the construction is completed.
- (i) Eutrophication - Not expected to occur.
- (j) Temperature – No change expected.
- (k) Others as Appropriate - None.

(2) Current Patterns and Circulation

- (a) Current Patterns and Flow – Will not change significantly
- (b) Velocity – Will not change significantly
- (c) Stratification - No change expected.
- (d) Hydrologic Regime - No change expected.

(3) Normal Water Level Fluctuations - Minor temporary changes in water level may occur due to the diversion of flow during construction.

(4) Salinity Gradients – No change expected.

(5) Actions to Minimize Impacts - A sediment erosion and control plan will be prepared prior to construction. This plan will indicate which best management practices are to be implemented to minimize the suspension of sediment during construction activities, thereby reducing impacts to water quality.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Project Site– There will be a minor increase in turbidity within the limit of disturbance and in the water surrounding the project site during construction. No adverse long-term environmental impacts are expected.

(2) Effects on Chemical and Physical Properties of the Water Column

- (a) Light Penetration - A minor, temporary decrease may occur during construction due to increase turbidity.
- (b) Dissolved Oxygen - No permanent change is expected.
- (c) Toxic Metals and Organics - No evidence exists to suggest the presence of

toxic metals or organics in the channel proposed for repair.

(d) Pathogens - No pathogens are expected to be released into the water column.

(e) Aesthetics - No adverse impacts are anticipated.

(f) Others as Appropriate - An erosion and sediment control plan will be prepared with best management practices implemented to minimize the suspension of sediment during construction activities.

d. Contaminant Determinations – Only clean contaminant free materials will be placed in the stream channel. No existing channel substrate is contaminated. A preliminary screening for known HTRW issues was conducted using EPA's Envirofacts database. There are three known small quantity hazardous waste generators and two air emission sources within 1,000 feet of the Toby Creek Impound Basin. There are no documented contaminated sites in the project area that will be impacted by the construction of this project. Therefore, no impacts from the proposed action are anticipated.

e. Aquatic Ecosystem and Organism Determinations

(1) *Effects on Plankton* - Impacts from turbidity generated during construction are anticipated to be minor and localized to the immediate construction area.

(2) *Effects on Benthos* – Heavy machinery working in the basin may be necessary. This would impact benthos. Repopulation of the disturbed area to pre-project levels is expected to occur within 1-2 years of project construction in areas that are not covered with stone. In the covered areas the benthos will be destroyed and suitable habitat will not be available for recolonization until the normal streamload covers the area. This is expected to occur in a few years after placement.

(a) Primary Production, Photosynthesis - Any turbidity generated during construction may reduce photosynthesis within the limit of disturbance area during the construction period.

(b) Suspension/Filter Feeders – Minor, temporary, and localized impacts due to turbidity may occur during construction in areas that are not covered with stone. In the covered areas the filter feeders will be destroyed and suitable habitat will not be available for recolonization.

(c) Sight Feeders - Minor, temporary, and localized impacts due to turbidity may occur during the construction period. Some permanent impacts may result as the bottom is changed due to hardening.

(3) *Effects on Nekton* - Construction activities will cause minor disturbances to nektonic organisms during construction.

(4) *Effects on Aquatic Food Web* - Changes are not expected due to loss of instream habitat. The existing stream is not of good quality so the net resulting effect on the food web is not considered significant.

(5) *Effects on Special Aquatic Sites*

- (a) Sanctuaries and Refuges – None present in the project area.
- (b) Wetlands – No effect since none are present in the project area.
- (c) Mudflats – None present in the project area.
- (d) Vegetated Shallows – None present in the project area
- (e) Coral Reefs – None present in the project area
- (f) Riffle and Pool Complexes - None –the stream has been altered
- (g) Tidal flats - No effect since none are present in the project area.
- (h) Vegetated Shallows - No effect since none are present in the project area.

(6) *Threatened and Endangered Species* – No threatened or endangered species have been identified within the project area.

(7) *Other Wildlife* – Construction will result in noise disruption of some species of wildlife during periods of work. Any urban tolerant species in the area will easily relocate to adjacent areas. Some animals are less active during the middle portion of the day when the operation is expected to occur. Therefore, the proposed project will minimally impact wildlife.

(8) *Actions to Minimize Impacts* – Activities will be performed in compliance with State and Federal standards and policies.

f. Proposed Disposal Site Determinations

(1) *Mixing Zone Determinations* – Not applicable.

(2) *Determination of Compliance with Applicable Water Quality Standards* - Work will be performed in accordance with all applicable State water quality standards.

(3) *Potential Effects on Human Use Characteristics*

(a) Municipal and Private Water Supply - NA

(b) Recreational and Commercial Fisheries - No public fishing is allowed in the TCIB, therefore impacts are not expected to be significant.

(c) Water Related Recreation - No public access is allowed in the TCIB, therefore impacts are not expected to be significant.

(d) Aesthetics - Minor, during construction only.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves - The project will not impact these areas.

g. Determination of Cumulative Effects on the Aquatic Ecosystem The project will restore storage capacity of the basin, improve the conditions of the area by the clearing of debris and sedimentation within the basin, and maintain the integrity of the structure. There are no other projects in the area which would combine with this project for a cumulative effect on the area's aquatic ecosystem.

h. Determination of Secondary Effects on the Aquatic Ecosystem – The proposed rehabilitation will restore the full functionality of the TCIB, and restore it to its designed configuration and strength. No secondary effects are anticipated as a result of this restoration.

III. FINDING OF COMPLIANCE

- a. No adaptations of the Section 404(b)(1) Guidelines were made relative to this evaluation.
- b. The planned placement of material will be in compliance with State water quality standards.
- c. The proposed placement of material is not expected to violate the Toxic Effluent Standard of Section 307 of the Clean Water Act.
- d. The proposed project will not negatively affect any endangered species.
- e. No Marine Sanctuaries, as designated in the Marine Protection, Research, and Sanctuaries Act of 1972, are in the project area.
- f. The proposed project will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife populations will not be significantly affected.
- g. Appropriate steps to minimize potential impacts of the placement of fill material in aquatic systems will be followed.
- h. On the basis of the guidelines, the proposed discharge sites are specified as complying with the inclusion of appropriate and practical conditions to minimize contamination or adverse effects to the aquatic ecosystem.